DEC 9 1946

FOOD INDUSTRIES

● FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION

oading the chamber of
ie "Freez-vac" unit

DECEMBER 1946

"Flash Freezing" Process for Foods

Ion Exchange Plant For Sugar Recovery

Growing Mung Bean Sprouts for Canning

Improving Low Grade Sweeteners

How To Tackle Food Packaging Problems

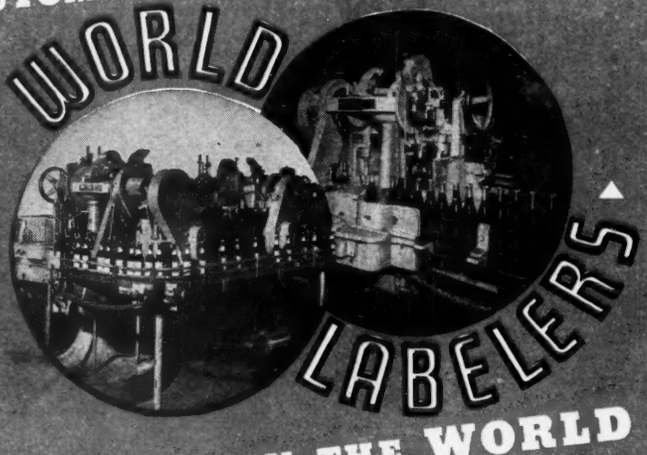
Preventing Rancidity In Frozen Sausage

Nationwide Exchange Of Shipping Pallets

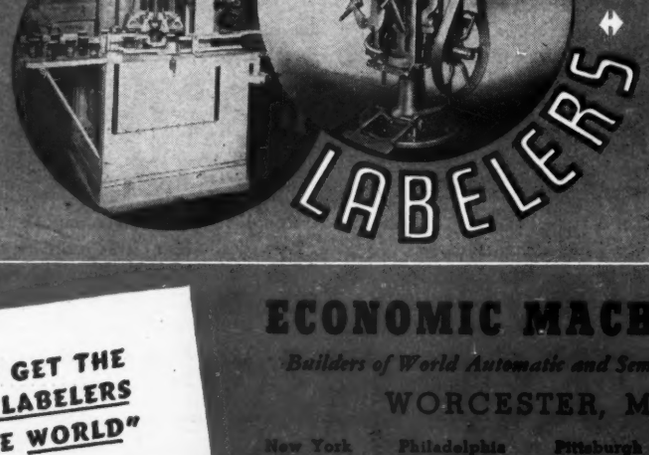
McGRAW-HILL PUBLICATION

WHATEVER YOUR LABELING REQUIREMENTS . . .

AUTOMATIC • SEMI-AUTOMATIC • HIGH PRODUCTION • VARIETY



YOU GET THE BEST LABELING IN THE WORLD



⊕ WORLD BEE-LINE
▲ WORLD ROTARY
✳ WORLD TURRET
⇹ WORLD MODEL-S

Write for Bulletins

"YOU GET THE BEST LABELERS IN THE WORLD"

ECONOMIC MACHINERY COMPANY

Builders of World Automatic and Semi-Automatic Labelers for Every Purpose

WORCESTER, MASSACHUSETTS

New York Philadelphia Pittsburgh Chicago San Francisco Denver
Louisville Salt Lake City El Paso Seattle Portland Phoenix London
Montreal Toronto Winnipeg Newfoundland Vancouver Mexico City
Sydney, Australia Wellington, N.Z. San Juan, P.R. Ciudad, Trujillo, D.R.

Outlook for 1947

TODAY'S indoor sport is guessing whether the autumn stock-market and cotton-market declines indicate an impending business recession. On the basis of logic alone there should be no recession, but man—especially in America—is seldom logical. On the basis of emotion, the predominant American trait, a recession may occur.

It seems to me, however, that all through 1946, beginning with the steel strike, we have been in a new sort of business recession—strictly Union Made, and despite reported high employment figures. While the total volume of business of the country has been very large it is, by no means, what it could have been had there been no strikes of the 1946 magnitude.

Union Made Recession?

If 1947 is to see a further recession in business it, too, will be Union Made. Thus far, the decline in total business volume is nothing to worry about. And it is difficult to foresee important reasons for this nation to do less business in 1947 than in 1946, except for work stoppages that may be imposed by organized labor, aggravated, to be sure, by any remnant of the government's past wage and price control policy. Many a 1946 demand for wage increases would have been granted, without work stoppages, had industry been wholly free in its negotiation with the unions. Hence, I find it impossible to get "het up" about the possibility of an old fashioned business recession in the near future. Admittedly we may experience more of the new type of slow down that we had in 1946. But the orthodox type of recession—with agricultural surpluses, factories idle because people can't or won't buy their products, empty houses, apple sellers and panhandlers, busted banks and mortgage foreclosures—that type is hardly to be expected in the near future.

The Union Made type of business slow down is not, however, a phenomenon peculiar to the United States of America. Among industrial nations, it appears to be world wide. Great Britain, Australia and New Zealand are complaining bitterly about it despite the fact that each has a Labor government. Even Russia has had a slow down.

Possibly I have an advantage over some observers in my sources of information. It would seem as if a quarter of the foreign commercial visitors to the United States call on FOOD INDUSTRIES. A larger number write from overseas. All have one purpose in common: to purchase industrial goods *and supplies*—especially packaging supplies—from America. Many of them formerly bought from Germany, but Germany is not producing now.

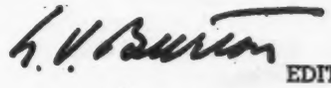
Too Much Domestic Business

American industries are not responding to this influx of proffered overseas buying. This office has received many letters from American manufacturers who tell us they cannot consider export orders in the immediate future; their contracts in domestic markets are all that can be fulfilled at present.

For the food processor there is, however, one important foreseeable future trend to be watched. That is the ending of UNRRA food exports to Europe on December 31, 1946; to the Far East on March 31, 1947. UNRRA is about to close up as an international relief agency. But that does not mean that food exports will cease. It means only that food export (mainly unprocessed cereals) must be purchased rather than received free.

If the foreign buyers have enough dollars with which to buy—all well and good; if not, it will mean the pipe lines overseas are being closed off and in time certain food commodities may be surplus in America. The U. S. Department of Agriculture is already alert to just this possibility and under AAA is taking proper steps to prevent the overproduction of agricultural commodities that must be sold at a great loss if burdensome surpluses are to be avoided.

My guess is that 1947 will be a year of some food price declines but of large business activity—if our fellow citizens will permit it.



EDITOR

The Talk of the Industry

• There were not enough Democrats to account for Roosevelt's four elections. Enough Republicans switched votes to make the New Deal possible.

• In a similar manner there are not enough Republicans to account for the recent election. They must have received Democratic aid. Some cynics claim, however, that there are Republicans, Democrats *and voters!*

• It is to be hoped that the country is now entering an era of wise control of power, whether that power be exercised by management or by organized labor. We are all in the same boat.

• Organized labor has learned only a part of the economic lessons it must master if it is to enjoy an increasing standard of living. The unlearned lesson, which it has flunked so badly in 1946, is the need for production before there can be distribution.

• All the talk about a greatly reduced national budget is eyewash. Some expenditures can be reduced, but Senator Taft *et al.* will learn that national security must not be impaired. And that's where the bulk of the money goes. At least, until the U.N. becomes a really going concern.

• One non-seasonal food company with two plants had a back log of unfilled orders amounting to 595 carloads on November 6—more than two months' production. That would be a pleasant situation were not the customers clamoring for immediate delivery.

• Whale meat and ox meat, hydrolysed by enzymes to produce a concentrated stable protein hydrolysate, have been used to feed very sick native children in Natal, South Africa, with remarkably beneficial effects in tuberculosis, hunger oedema and some 18 other diseases seemingly associated with or caused by malnutrition. Apparently World War II took away many native food supplies, resulting in an astounding increase in tuberculosis. A preliminary report by B. A. Dormer, M.D., D.P.H., B.Hg., TDD., F.C.C.P. was issued by the South African Red Cross Society (Natal Branch) in December, 1945 and was only recently sent to us by a considerate reader of Food Industries.

Whale meat was used merely because it was a very low cost source of meat protein.

• Republicans will do well to listen to Democratic Senator George who, though from Georgia, is a man of Yankee thrift and stark realism. He has been chairman of the Senate Finance Committee for years, and is one of the best informed men in the nation about budgets and taxation.

• Rumor has it that cotton seed hulls are worth more for making "pure" black pepper than the value of the seed for oil crushing. With real pepper selling at more than 12 times its prewar price, maybe there is something to the tale.

• THE date as produced in Iraq is unique in that it is the only natural dehydrated fruit. Man needs to contribute nothing but the labor of harvesting the completely "processed" product from the trees.

• "COMMERCIAL can openers have not been satisfactory under Army conditions where a large number of cans have to be opened daily . . ." The foregoing is quoted from Project No. 164-44 of the Research Program, 1946-1947, Office of the Quartermaster General. We refrain from the obvious comment, such as advocating a period after the word satisfactory, but express the hope that the Army research may at long last produce a good can opener.

Hors d'Oeuvres

• An atom bomb generates a temperature of 100,000,000 deg. F. Warm, eh!

• *The War Assets Administration is, or was, offering for sale a "grain alcohol plant for making alcohol from molasses." We hope and trust the formula goes along with the plant.*

• Back in October we wondered how P & G got the "0.66" percent impurities into Ivory Soap. The mathematicians have been throwing 0.56's at us ever since. Fie to them. After what happened to farm products in general, during October, they should jump on us for a 0.1 percent markup.

• *At the Quartermaster Institute laboratories, the highly qualified tasters may not have a look at the kitchen, at the color of the food they are tasting, or even at each other. Could they have a mirror, maybe?*

• According to the Electrical manufacturers, an electric drill also can be used to churn butter, sand wood and metal, wind small springs or twist wire. Handy damn thing, isn't it.

• *The United States Brewers Foundation quotes Dr. Bernard L. Oser as saying that the beer drinker's "tongue and palate 'remember' its taste, his nose 'remembers' its aroma, his mouth 'remembers' its temperature and its bubbly tang, his eyes 'remember' its color, its clarity and its foam." No wonder it makes you sleepy, sometimes.*

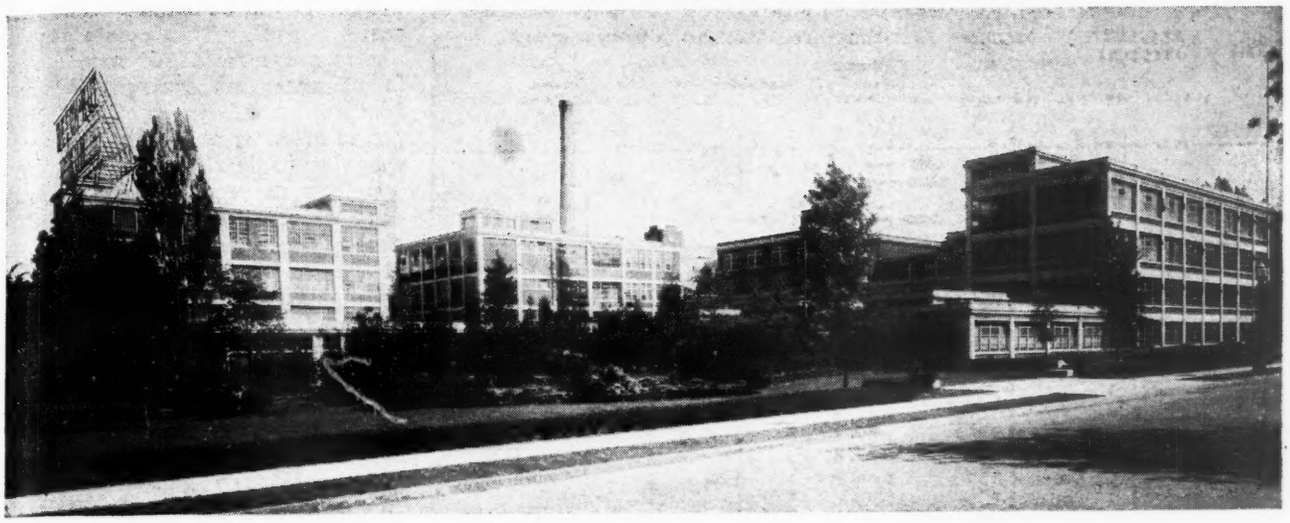
• The beer people also headline another story with "Scientist Declares Prohibition 'Doesn't Work.'" Somehow we feel that this isn't one of those hasty conclusions so often jumped at by the non-scientific mind.

• *Complete decontrol of all food and grocery products, except sugar, by November 1, was forecast by Paul S. Willis, on October 17. That the prognostication was not 100 percent perfect can hardly be blamed on the GMA president. Rough and finished rice would be mighty hard to distinguish from sugar in a crystal ball.*

• The American Magazine tells us that some day we may be getting eggs for Christmas with red and green yolks. We have had some with very dark brown yokes—but they were not for Christmas.

• *Which brings us to wishing you a very Merry Christmas from all of us to all of you.*

J.A.J.J.



The "flash freezing" process is in use at the Canajoharie, N. Y., plant of Beech-Nut, Inc.

"Flash Freezing" of Foods

Steam jet vacuum flash freezing is a new method of freezing bulk foods, employing the principle of flash evaporative cooling under high vacuum. Freezing action is unique. Products differ from those made in other ways

By L. CHARLES MAZZOLA, Associate Editor*, "Food Industries"

ORTHODOX methods of freezing food products employ a variation of one of four approaches or combinations of them. All of them use a cooled medium in contact with the product to be frozen. The media used are either: (1) cold plates, (2) cooled liquid, (3) cold blast, or (4) cold room with product agitated or conveyed through it mechanically.

"Flash freezing" operates on a different principle, and solves the problem from a different approach. No cooling medium is employed. The freezing is accomplished by flash evaporating, in a high vacuum, a part of the moisture content of the food being frozen. The resulting product is different from the conventional frozen foods in three primary ways: (1) It contains most of its original moisture, some having been used up in freezing; (2) it freezes in individual, separate pieces that are not stuck together in a matrix of ice; and (3) its original volume is retained though there is a loss in weight due to water evaporation. Peas are bright colored individual, hard-frozen spheres; sliced beets and cut celery likewise are not stuck together but frozen as individual pieces, bright in color. No defrosting of equipment is required, in contrast with the operation of conventional freezing equipment.

Theory of Operation

As is well-known, atmospheric pressure is 760 mm. Hg (29.9 in.) at normal sea level and water boils at 212 deg. F. As the altitude increases, the boiling point of water progressively decreases because the atmospheric pressure decreases (Fig. 1). During the boiling process large amounts of heat are absorbed in converting the water into steam (water vapor). This heat absorption makes flash freezing possible. As an illustration: If water having a temperature of 60 deg. F. enters a chamber with a pressure reduced to 9.2 mm. Hg (29.6 in. vacuum) some of it will "flash" into water vapor. The only heat available is that carried in by the water. For each pound of water entering the system at 60 deg. F., 10 B.t.u. are released in cooling it to 50 deg. F.—its boiling point under the reduced pressure conditions given. Therefore, the heat removed from 100 lb. of water cooling from 60 to 50 deg. F. will provide 1000 B.t.u., which suffice to evaporate 1 lb. of water. In other words, for each 100 lb. of 60-deg. F. water entering the system, 1 lb. is "flashed" into vapor and 99 lb. are cooled to 50 deg. F. To maintain the given reduced pressure obviously the water vapor must be removed as fast as it is produced.

In Fig. 1 there is presented in correlated form some basic information on pressures, boiling points of water and sublimation of ice. From this an idea can be had of the prodigious volumes of water vapor to be handled in flash freezing. The last column to the right, reading down, gives the specific volume of water and ice vapor in cubic feet per

* Now vice-president, Riverbank Canning Co., 99 Hudson St., New York, N. Y.

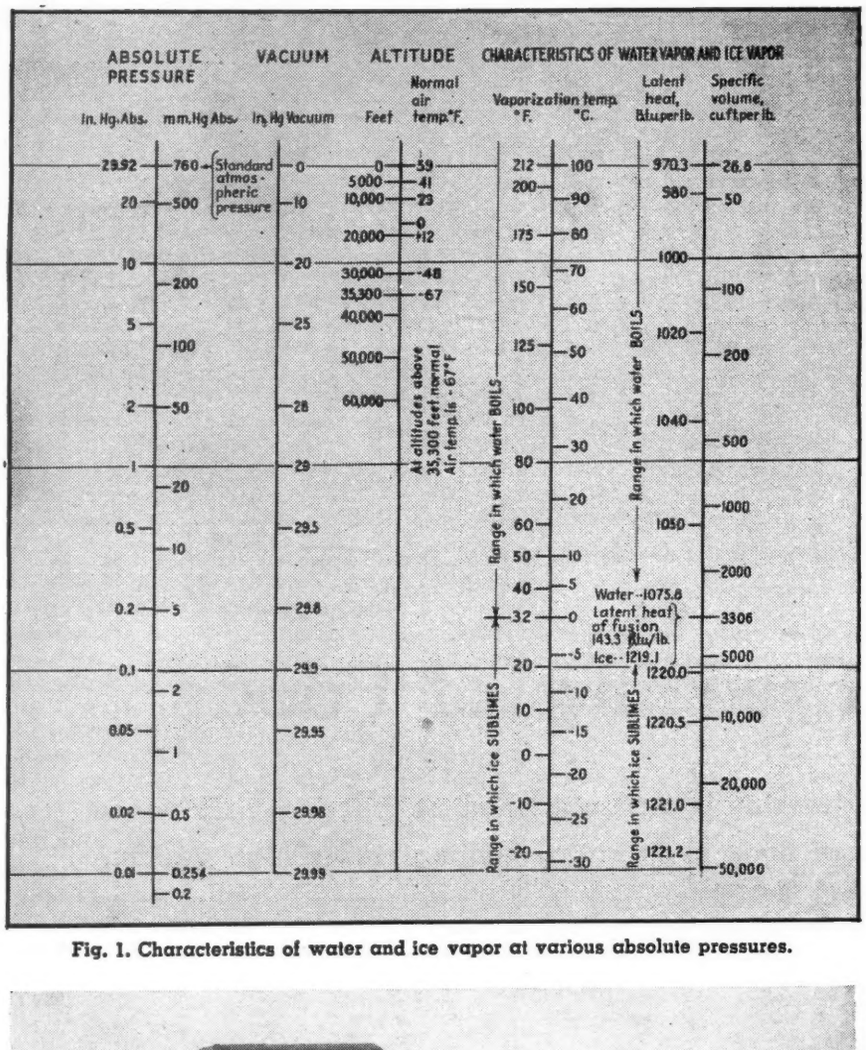


Fig. 1. Characteristics of water and ice vapor at various absolute pressures.

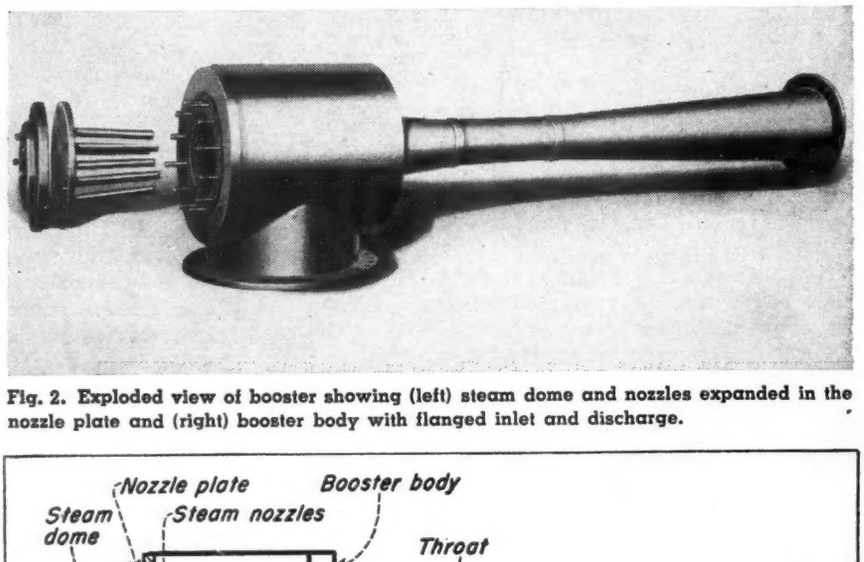


Fig. 2. Exploded view of booster showing (left) steam dome and nozzles expanded in the nozzle plate and (right) booster body with flanged inlet and discharge.

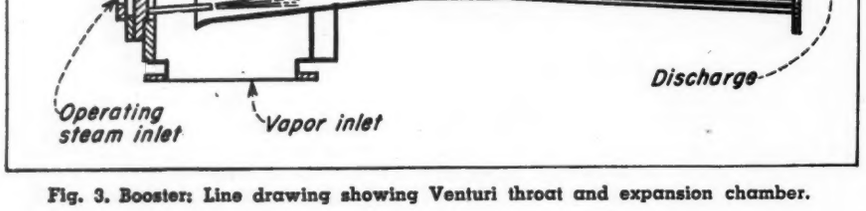


Fig. 3. Booster: Line drawing showing Venturi throat and expansion chamber.

pound. It will be noted that at normal sea level, with absolute atmospheric pressure of 760 mm. Hg, 1 lb. of water evaporates to become 26.8 cu. ft. of vapor. That same pound of water at 50 mm. Hg pressure (equivalent to 28 in. vacuum, which is the approximate average absolute pressure at 60,000 ft. altitude), produces about 375 cu. ft. vapor. At an absolute pressure of 0.5 mm. Hg (equivalent to 29.98 in. vacuum), 1 lb. of water produces about 30,000 cu. ft. vapor. And, at 0.254 mm. Hg absolute (equivalent to 29.99 in. vacuum), 50,000 cu. ft. of water vapor must be removed for each pound of water vaporized.

As previously explained, water can be made to "flash cool" itself by admitting it to a chamber whose absolute pressure is low enough. From Fig. 1 it may be seen that water can similarly be made to flash freeze itself. Whether the water cools or freezes depends upon the absolute pressure maintained in the chamber. This principle may be applied to the freezing of foods. Residual surface moisture from the previous preparatory operation, and part of the moisture of the product itself are immediately vaporized when subjected to a high vacuum, thus extracting from the product the latent heat of vaporization and the latent heat of fusion. Because the product itself is the only source of heat, and since heat is extracted from it, it promptly freezes.

Thermodynamic Aspects

The thermodynamics of this method of producing a refrigeration effect are not at all mysterious if we take an example and follow the steps involved.

Let us assume we have 100 lb. of blanched peas at 212 deg. F. We wish to freeze these and bring them down to 0 deg. F. We shall consider separately the steps of (1) cooling from 212 deg. F. to 32 deg. F., (2) freezing, (3) subcooling from freezing to 0 deg. F.

First consider the 100 lb. of peas admitted into a vacuum chamber. Here the absolute pressure is maintained so low that water can easily boil, even at 32 deg. F. The water on, and in, the blanched peas at 212 deg. F. will naturally tend to boil (vaporize) in this chamber. Now when each pound of water vaporizes, roughly 1000 B.t.u. are required to change that water from its liquid state to a vapor state. No outside source of heat is involved. Instead we have available the residual heat of the peas themselves. When a

pound of water vaporizes it draws its latent heat of vaporization from the peas, thus causing a cooling of the remaining water and peas. Let us see how this can be expressed mathematically.

The latent heat of vaporization of water at 32 deg. F. is 1076 B.t.u. per lb. The specific heat of peas is approximately 0.80. Thus:

Heat used to vaporize water = Heat removed from peas. Lb. water vapor × 1076 B.t.u. per lb. = 100 lb. peas × (212 − 32) × 0.8 (sp.ht.). Or:

$$\text{Lb. water vapor} = \frac{100 \times (212 - 32)}{1076} \times 0.8 = 13.4 \text{ lb.}$$

Thus by "flashing" 13.4 lb. of water to vapor we have cooled the whole charge from 212 deg. F to 32 deg. F, and we now have 100 lb. of peas less 13.4 lb. of water, or 86.6 lb. of precooled peas.

Next consider freezing the peas by the same principle employed above. Although the peas are at 32 deg. F., they still have a great deal of residual heat (they are not frozen and are a long way from absolute zero). The heat of fusion of peas is approximately 108 B.t.u. per lb. Again:

Heat used to vaporize water = Heat removed from peas. Lb. water vapor × 1076 B.t.u. per lb. = 86.6 lb. peas × 108 B.t.u. per lb. heat of fusion. Or:

$$\text{Lb. water vapor} = \frac{86.6 \times 108}{1076} = 8.7 \text{ lb.}$$

By vaporizing 8.7 lb. of water we have removed enough heat to cause freezing to take place, and the charge of peas now weighs 86.6 lb. less 8.7 lb. of water or 77.9 lb. (For simplification of this illustration we are assuming that peas freeze at 32 deg. F. Actually, the range of maximum ice crystal formation in frozen foods is from about 31 deg. F. to 25 deg. F.)

To further cool the frozen peas by the same method, we take advantage of the fact that ice will sublime, that is, pass directly from the solid state to the vapor state without becoming a liquid. A well-known illustration of this phenomenon is the subliming of dry ice at atmospheric conditions. Therefore, further use is made of the residual heat in the frozen peas in cooling them from 32 deg. F. to 0 deg. F. The latent heat of sublimation of ice is approximately 1220 B.t.u. per lb. The specific heat of frozen peas is approximately 0.42.

So finally:

Heat used to sublimate ice = Heat removed from peas. Lb. of ice vapor × 1220 B.t.u. per lb. = 77.9 lb. peas × (32 − 0) × 0.42 (sp.ht.). Or:

$$\text{Lb. ice vapor} = \frac{77.9 \times (32 - 0) \times 0.42}{1220} = 0.858 \text{ lb.}$$

Here, sublimation of a small part of the ice in the peas has caused cooling to 0 deg. F. The charge of frozen peas now weighs 77.9 lb. less 0.858 lb. or 77 lb.

The example presented above has been somewhat simplified. In all probability there is no well defined point where cooling ends and ice crystal formation begins due to the several kinds of solutions and suspensions of salts and minerals present in the food. Nevertheless, actual production records show that for each 100 lb. of graded, washed peas which are charged into the machine, after blanching, precooling and freezing approximately 75 lb. of frozen product are discharged.

Application of Principle

Any device that can produce a high degree of vacuum and has a high volume capacity can be theoretically employed for flash freezing. Since the freezing is accomplished by flash evaporation of some of the water of the product,

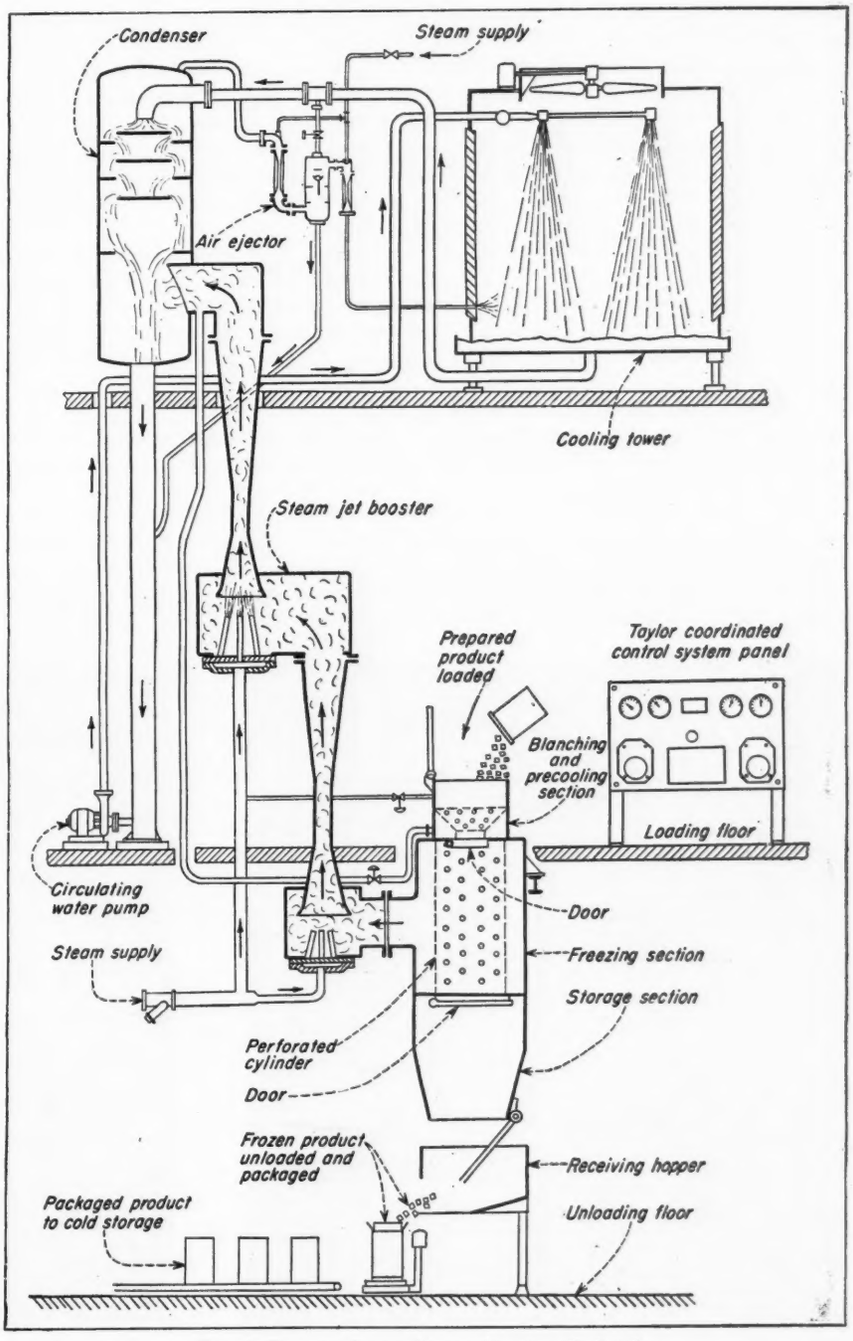


Fig. 4. Barometric condenser functional sketch

obviously no chemical refrigerant is needed. This eliminates the need for the usual compressors, special piping, surface type heat exchangers, refrigerant condenser and all the equipment that goes with it.

One system, based on this principle, which produces qualitatively, as well as economically, satisfactory results is the Ingersoll-Rand "Freez-Vac" freezer. Direct evaporative freezing is produced by a high vacuum created by a steam-jet ejector system. This system was chosen as a means of producing the necessary low absolute pressure because this simple type of vacuum equipment has proven itself in the process and chemical industries over the past 20 years. Steam jet ejectors are the type of vacuum equipment most used when large volumes of vapors must be exhausted from these high vacuums. No special foundations or vibration-isolating devices are needed with this type of installation as the only rotating equipment is a water circulating pump.

Booster

The heart of the system is the steam-jet booster (Fig. 2, Fig. 3). It consists essentially of several steam nozzles discharging jets of steam at velocities of 3500 to 4250 feet per second across a suction chamber and through a Venturi shaped compression tube. Water vapor from the freezer enters the booster, is entrained by the jets of steam, and is discharged through the throat and diffuser, where the velocity or kinetic energy is converted into pressure. The mixture is thus compressed and discharged into the condenser at a relatively higher absolute pressure (lower vacuum). The proportion, size and arrangement of the essential parts have an important effect on the capacity and compression range per pound of operating steam used.

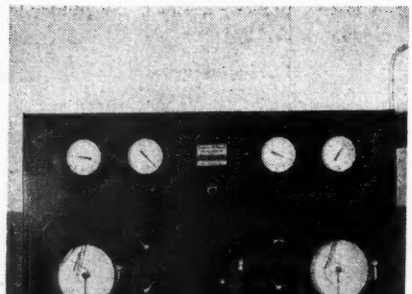


Fig. 5. Taylor co-ordinated control system panel

Condensers

For efficient operation it is imperative that the condenser vacuum be as high as possible. This is so because, at the low pressures employed in the system, unless condenser pressures are also low the efficiency of the operation would be inversely proportional to the resistance offered. Barometric type condensers are used, giving counter-current direct contact of cooling water with the booster exhaust. They are simple and non-clogging. The main condenser is served by a small two-stage ejector which discharges leakage air to the atmosphere continuously.

Operating Cycle and Controls

The Ingersoll-Rand unit called "Freez-Vac" (Fig. 4) includes blanching and precooling section, door opening into freezing section, freezing section and storage section, and door opening to deliver frozen product.

After the load of prepared vegetables has been dumped into the "Freez-Vac" the operator pushes a button and the loading door closes. From this point on the operations of blanching, precooling and freezing are carried on automatically by a Taylor Co-ordinated Control System (Fig. 5). The heart of this is the time-cycle controller which is easily adjustable to give any desired variation in cycle of operations.

After the operator dumps in the charge the cycle starts. Blanching steam is admitted and the "Timer waits," as indicated by signal going out. At this point a temperature controller takes over, automatically bringing the product up to a predetermined temperature (Fig. 6). Now the "Timer" resumes, maintaining the product, in conjunction with the temperature controller, at the given temperature for any pre-

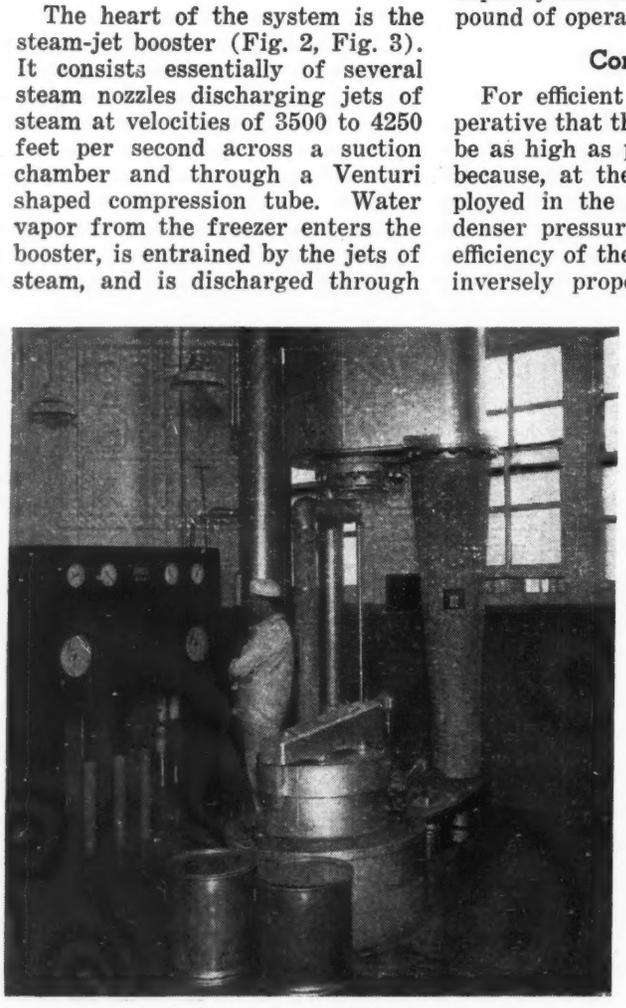


Fig. 6. Blanching is controlled automatically.

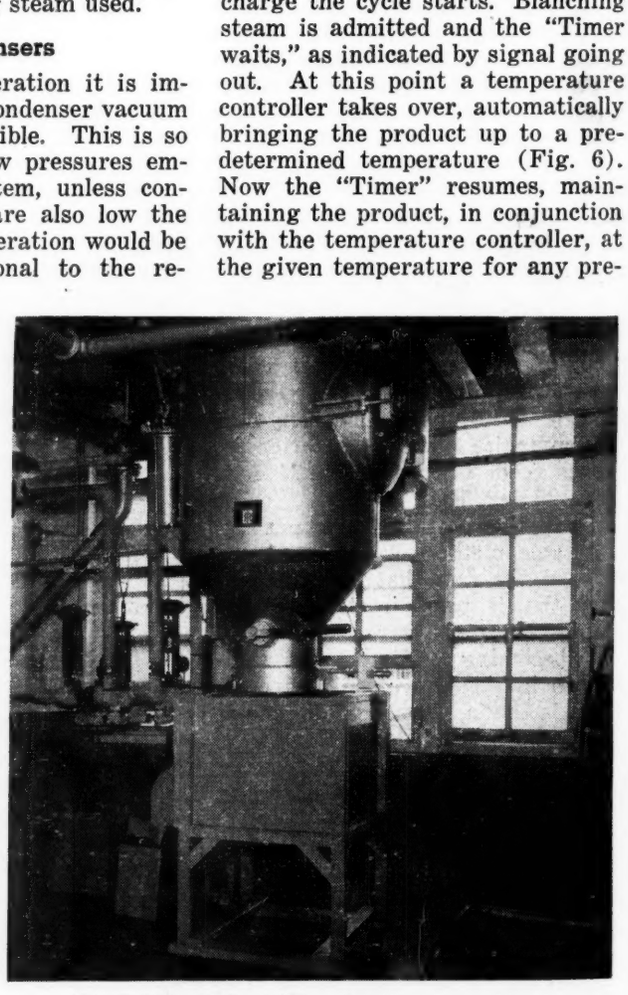


Fig. 7. Main body of "Freez-Vac" on lower floor.

determined period for which it has been set. After the blanching operation is completed the blanching steam is shut off and the precooling operation is begun. As soon as this charge is precooled it is automatically dropped to the "inner" chamber for freezing. As the freezing operation begins the loading door opens and the next charge is loaded for blanching. The loading door is now closed and while the second charge is being blanched and precooled the first charge is being frozen. The frozen charge is now dropped to "lower" storage chamber, the second blanched and precooled charge is dropped to freezing "inner" chamber and the loading door opens to receive the third load for blanching and precooling. This completes the cycle and is repeated as a continuous operation.

The "lower" storage chamber can hold four frozen charges. While precooling any charge the vacuum can be broken in "lower" storage chamber and the unloading door opened in order to remove and package the frozen product (Fig. 8). As a safety feature, each time the loading door opens, the "timer waits" signal is on and the loading door will not close until the operator pushes the starting button. On a typical vegetable like peas, the time required for blanching, precooling and freezing is from 7 to 8 min. A complete 4-charge cycle requires from 25 to 30 min. Variations in the cycle of operation are almost unlimited. Time, temperature, operation sequence and inclusion or exclusion of a step can all be altered to suit particular requirements. For example, blanching can be eliminated. Or, if a product needs only to be chilled, instead of frozen, this can be done.

The first application of the "Freez-Vac" unit has been for freezing material intended for commercial reprocessing. So far, the following items have been satisfactorily flash frozen: peas, cut beans, cut celery, sliced carrots, sliced beets, sliced onions, sliced apples, sliced pears, sliced peaches, lima beans, mushrooms, cooked and raw meat chunks. It is probable that many other vegetables, some fruits and sea foods will be appropriate products for this method of freezing although this remains to be determined. Whether flash frozen products will find a market as consumer products is a field to be explored. Howard and Campbell's* work on "Dehydrofreezing" might be taken as an indication. In this method the foods, after preparation and blanching, were partially dehydrated, then frozen. Much more moisture is removed from the foods than is evaporated during flash freezing. Yet these advantages are pointed out: A saving in weight, space, packaging materials and storage refrigeration load.

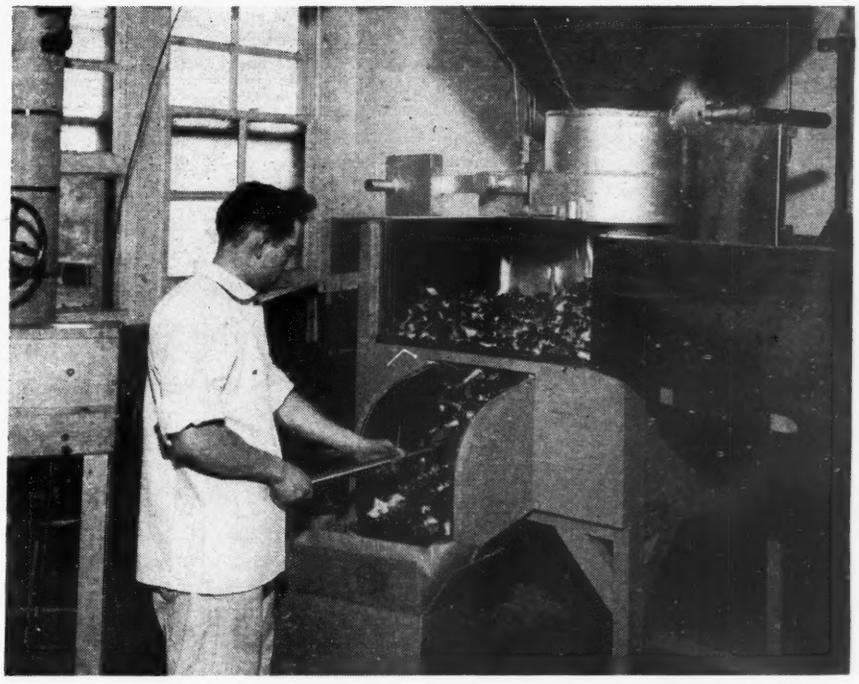


Fig. 8. Discharging frozen foods from "Freez-Vac".

In flash freezing, the volume of the product is substantially unaffected. Peas, for instance, retain a smooth, bright appearance. No frost forms on the surface of the frozen foods, absence of which permits pieces to freeze individually with no tendency to freeze or stick together. Product oxidation does not occur because refrigeration takes place in the practical absence of oxygen and also because the blanched product is precooled and frozen immediately after blanching without being exposed to atmosphere. Approximately 25 percent of the original weight of the product is lost as water vapor during flash freezing.

Although the flash frozen foods have not yet reached the consumer market in their frozen form they are presently being used as ingredients in Beech-Nut Strained Foods and Junior Foods.

Thawing is rapid due to the food pieces being individually quick frozen. The moisture reduction which occurred in flash freezing is easily regained when the frozen food is mixed with the other ingredients of the final product.

In preparing strained beets for infant feeding from fresh beets

(*Turn to page* 210)

* Howard and Campbell, "Dehydrofreezing—New Way of Preserving Food," Food Industries, p. 88, May, 1946.

TABLE I—Comparison of Typical Celery Cost Data

	1. Purchased from	2. How processed	Local Market Trimmed, frozen and stored at harvest time	Local Market Held in crates in cold storage until needed for process	Distant Market Purchased at the time needed for processing
Per 80 lb. crate:					
3.	Cost of crate of celery, delivered		$2.300	$2.300	$5.660
4.	Transportation from cold storage		Nil	$0.110	Nil
5.	Cold storage Nov. through Jan		Nil	$0.125	Nil
6.	Cleaning and trimming		$4.660	$4.660	$4.660
7.	Total cost trimmed		$6.960	$7.195	$10.320
8.	Yield of trimmed celery per crate		70 lb.	53 lb.	72 lb.
Per pound:					
9.	Trimmed celery		$0.09940	$0.1358	$0.1430
10.	Freezing and packaging in bulk containers		$0.01160	Nil	Nil
11.	Transportation to and from zero storage		$0.00315	Nil	Nil
12.	Zero storage, Nov. through Jan		$0.00349	Nil	Nil
13.	Cost of trimmed celery in Jan		$0.11764	$0.1358	$0.1430
On 200,000 lb. basis:					
14.	Cost of trimmed celery		$23,528	$27,160	$28,600
15.	Savings by using local frozen stock		.....	$ 3,632	$ 5,072

Ion Exchange Plant Recovers Sugar from Fruit Waste

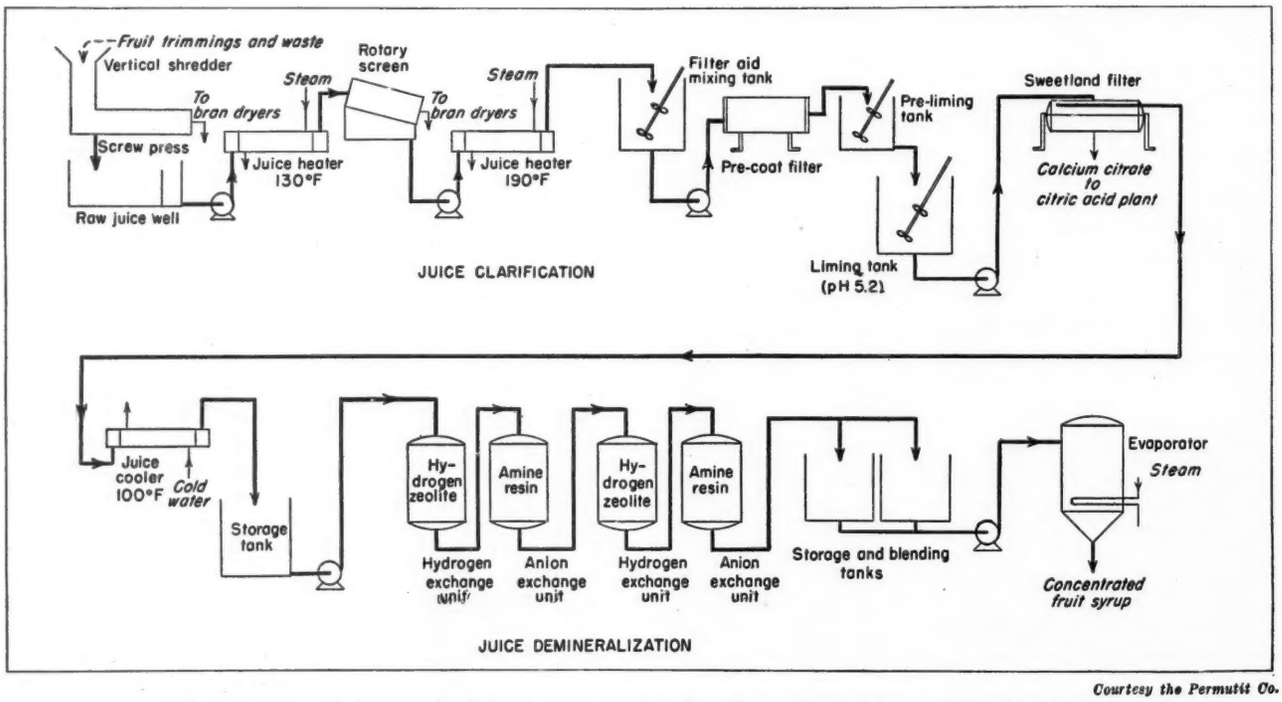
Hawaiian pilot plant demineralizes 3,000 gals. of juice from pineapple shells daily. Sirup recovered can be used in canning. A commercial plant is being built. A similar process will be used for Florida citrus waste

RECOVERY of natural sugar from non-potable fruit juice is a recent and highly successful adaptation of the ion exchange process used in water softening and demineralization systems. There will be two large-scale commercial plants in operation next year, producing sirup from fruit waste. One unit is the $750,000 plant now being built at the Honolulu cannery of the Hawaiian Pineapple Co., for processing up to 300,000 gals. of juice in a 20-hr. day. It will yield 4,000 tons of sugar sirup annually and will also result in an increase in the recovery of citric acid.

The other ion exchange plant is to be ready on January 1 for daily treatment of 25,000 gals. of citrus peel press juice at the rebuilt Dunedin, Fla., plant of Citrus Concentrates, Inc. This process is being installed by the Permutit Co. Orange or grapefruit peel, after removal of the juice or fruit sections, is pressed in order to remove as much liquid as possible prior to drying the peel for cattle feed. The non-potable juice contains about 9 percent of solids, of which two-thirds are sugar. Sugar is recovered as sirup by the successive steps of juice clarification, demineralization and concentration.

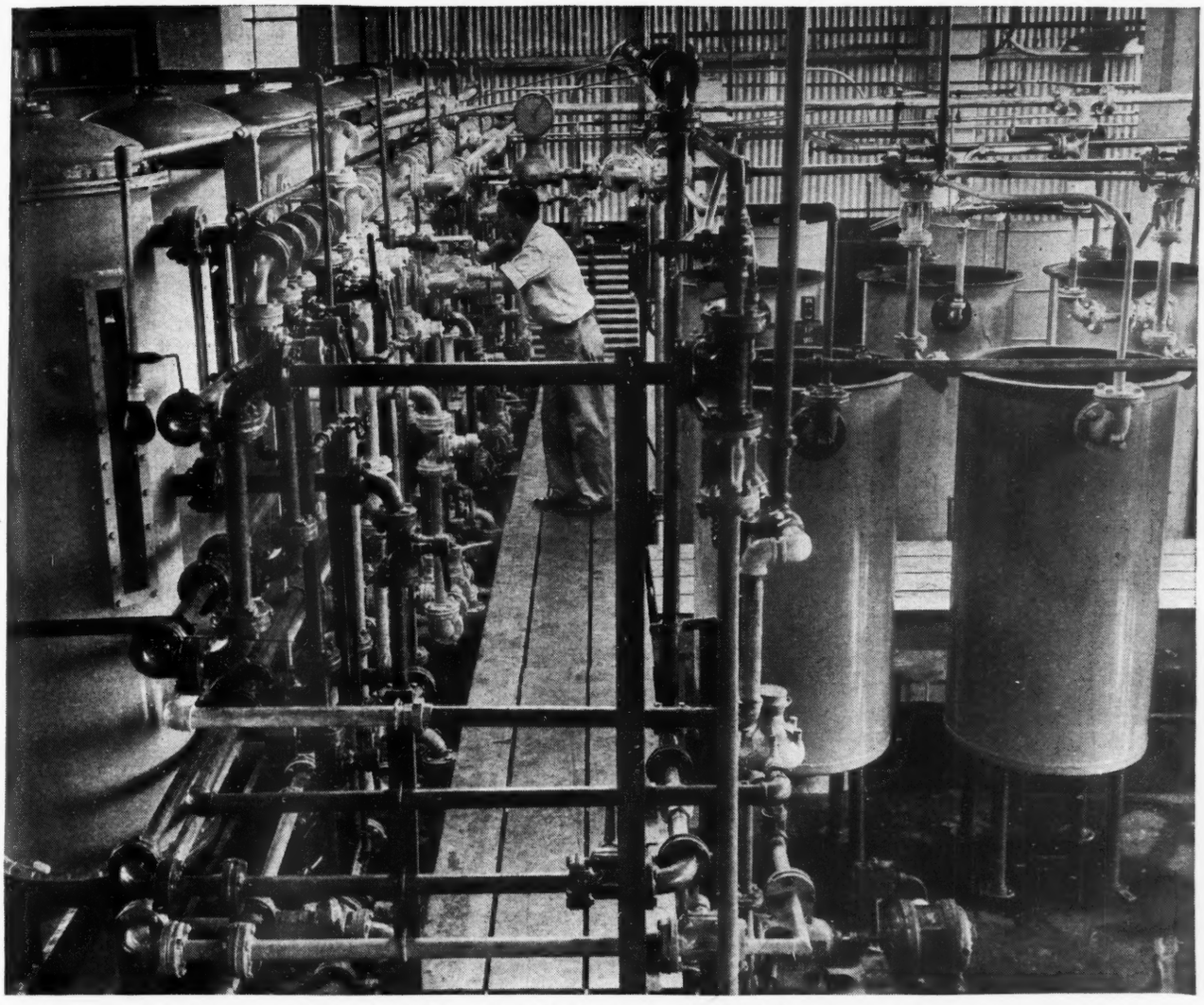
Hawaiian Pineapple's process was worked out in the chemistry section of the company's own research department, under the direction of George E. Felton. A $50,000 pilot plant has been in successful operation, processing daily 3,000 gals. of juice, obtained by pressing out the outer shells of the fruit. About 9 percent of this is sugar, with 89 percent water and the remainder citric acid and other dissolved solids. Hitherto it has been processed for citric acid, which has been refined and shipped to the mainland, and the juice, after concentrating, has been disposed of in livestock feed. The recovery of large quantities of sugar, now in prospect, will make more self-contained an industry using 17,000 tons of sugar annually in canning.

In principle and in equipment design, the methods used for citrus and pineapple wastes are closely similar. Citric acid is removed by lime precipitation. Filtration is at high temperature, requiring cooling of the juice before it goes through the ion exchange process. The ion exchange or demineralization plant includes units in pairs, with the first unit of the pair containing a cation exchange bed and the second unit of the pair an anion exchange bed. In addition, equipment is necessary for preparation of the re-



Courtesy the Permutit Co.

Flow diagram of demineralized fruit sirup plant for handling citrus waste or pineapple waste.

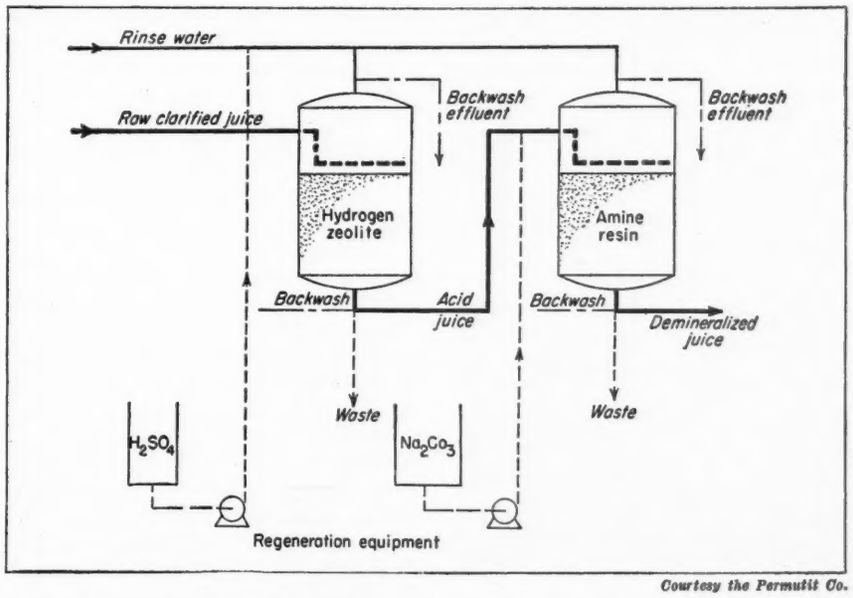


Honolulu pilot plant of Hawaiian Pineapple Co. is treating 3,000 gals. of juice from waste daily. Demineralization takes place in the ion exchange units at the left. Open top tanks at the right are used for preparing regenerants. Sirup recovered is of excellent taste, suitable for use in canning. Operation of the full-scale plant will make possible the recovery of 4,000 additional tons of sugar sirup annually. Process was worked out in the chemistry section of the Hawaiian Pineapple Co.'s own research department.

generants for the ion exchange materials. Demineralization is virtually complete and the treated juice is neutral, ready for concentration in the evaporator.

Deionization of the juice involves two steps. The cation exchange unit, containing a hydrogen zeolite, removes metal cations and other cationic constituents by exchanging hydrogen ions to form the corresponding acids. Calcium and magnesium, for example, will be retained by the cation exchanger bed, much as in the case of water softening equipment. The acid juice passes into the anion exchange unit, containing an amine resin, where the acids are removed.

Valuable acids taken up by the anion exchanger can be recovered. Citric and malic acids can be obtained as salts or as acids, depending on how the anion exchanger is regenerated.



Courtesy the Permutit Co.

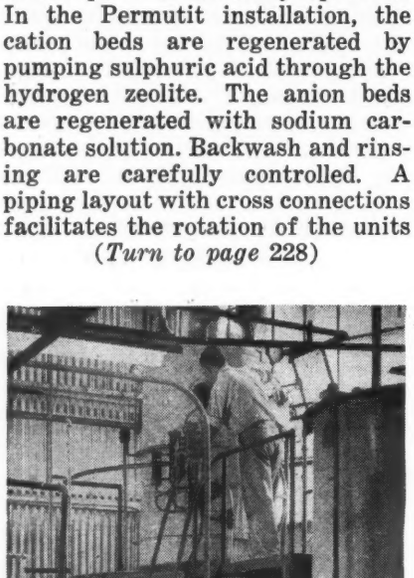
Flow diagram of regeneration equipment for one pair of ion exchange units. The regenerated exchangers are water washed before juice purification is resumed.

Non-electrolytes pass through the exchange process without being taken up. It is thus possible to remove the electrolytes from any sugar solution, forming sirup improved in taste and odor. Aside from the citrus and pineapple processes, the ion exchange system is under investigation for the treatment of cane and beet sugar, where the molasses-forming sodium and potassium cations and the scale-forming calcium ions are removed, in addition to certain other undesirable constituents.

After a period of operation, the ion exchange beds become exhausted. The exchange materials are then regenerated and restored to original efficiency. In one plan of rotation, the freshest beds are used for finishing the juice, with the raw juice going to the beds next in line for regeneration. Units are cut out in pairs for regeneration and rinsing.

The regenerants are expendable, although they are simple and inexpensive chemicals. The exchange materials can be used indefinitely if the plant is carefully operated. In the Permutit installation, the cation beds are regenerated by pumping sulphuric acid through the hydrogen zeolite. The anion beds are regenerated with sodium carbonate solution. Backwash and rinsing are carefully controlled. A piping layout with cross connections facilitates the rotation of the units

(*Turn to page* 228)



After demineralization, the juice is concentrated. This is the evaporator in the Hawaiian Pineapple Co.'s pilot plant.

Most Progressive Food Company To Receive Technology Award

First biennial Food Industries Award to be decided by jury who will receive applications and recommendations

DR. ELLERY H. HARVEY, president of the Institute of Food Technologists, announces selection of a jury of IFT members who will study the food processing industry during the next six months to determine what food manufacturing company, within the past two years, has made the greatest advancement in developing a new food, or in improving production or cost of production, in improving flavor, nutrition or quality of any commercially prepared food, or improvement in any other technological procedure. To the food manufacturing company which has made the greatest achievement in Food Technology, in the opinion of the jury, will go the first of the new biennial Food Industries Awards, a bronze plaque contributed by the award's namesake, Food Industries magazine. Presentation of this new award will be made at the annual conference of the Institute of Food Technologists which will be held in Boston next June.

"Food Technology," says Dr. Harvey, "applied to commercial food processing has barely scratched the surface to bring about great human benefits in better eating and better living. Following postwar reconversion in the food processing industry, many more beneficial developments are going to appear as a result of applied food technology.

"The purpose of the award is to stimulate aggressive progress in this direction by recognizing in an appropriate manner the firm which has made the outstanding achievement during each current two-year period. The award will be given to a food company, not to an individual, in order to encourage the cooperative team work that is the basis of industrial progress."

The following members of the Institute of Food Technologists are serving as the Food Industries Award Jury which will make this year's selection: Dr. Clyde H. Bailey, University of Minnesota, St. Paul, Minn.; Clarence Birdseye, Processes, Inc., Gloucester, Mass.; Dr. Morris J. Elish, International Minerals and Chemical Company, Rossford, Ohio; Dr. E. J. Cameron, National Canners Association, Washington, D. C.; Louis E. Dietrich, American Home Foods, Inc., Pittsburgh, Penna.; Robert Dillman, Libby, McNeil and Libby, Chicago, Ill.; Ray Junk, California and Hawaiian Sugar Refining Company, San Francisco, Calif.; James McGowan, Campbell Soup Company, Camden, New Jersey; Carl S. Miner, The Miner Laboratories, Chicago, Ill.; J. B. Pardieck, California Vegetable Concentrates, Inc., Huntington Park, Calif.; Dr. Bernard E. Proctor, Massachusetts Institute of Technology, Cambridge, Mass.; Allen H. Saul, Beechnut Packing Co., Canajoharie, N. Y.; Robert D. Scull, Burnham and Morrill, Portland, Me.; Dr. Ernest H. Wiegand, Oregon State College, Corvallis, Ore.; and Dr. Laurence V. Burton, McGraw-Hill Publishing Co., New York, N. Y., Secretary of the Jury.

The Award Jury will make its selection within the following limitations:

1. The award will be given to a firm or company in the food processing industry.

2. The achievement to be awarded must be in technologically successful industrial production for at least a year prior to the award. The food produced under the process that is to receive the award must have been on sale in one or more markets throughout the year preceding the award.

3. The achievement is not limited to patented processes.

4. The achievement may be found in any form of food processing of any sort of raw food material for human consumption. It may be given for any new food, improved engineering, reduced cost of production, improved flavor, nutrition or stability of quality in the channels of commerce, for improved packaging or for any food technological improvement that, in the judgment of the jury, shall merit the Award.

Applications or recommendations for the Food Industries Award may be submitted to any member of the Award Jury if accompanied with substantiating evidence of merit of achievement in any of the above outlined endeavors.

Dairy Exposition Highlights

Sanitation, labor saving and new packaging were features that interested 20,000 ice cream and dairy men viewing new and improved equipment and supplies at the Dairy Industries Exposition in Atlantic City in October

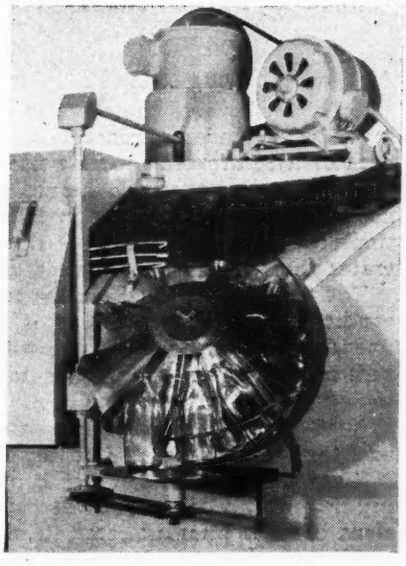
WHILE refinements in established equipment rather than radical changes in design were the general rule, the one question asked most at the 15th Dairy Industries Exposition, in Atlantic City, late in October, remained unanswered. Exhibitors would promise nothing in the way of deliveries for periods ranging from one to three years. That this question was uppermost in the minds of the more than 20,000 visitors was indicated by at least one exhibitor who had cards printed explaining that the equipment on display had already been sold and was being shown through the courtesy of the owner. In another case the exhibitor refused to discuss deliveries at all, explaining that his company felt they were fortunate to have even the one machine to display.

New Equipment

The refinements, for the most part, emphasized ease of cleaning, improved sanitation, labor saving, and improved appearance. There were, however, a few innovations in equipment and supplies that attracted show-wide attention. Among these were:

1. An automatic ice cream brick cartoning machine. In this machine the cartons are formed and one end is closed and locked automatically. The cartons are uniformly filled, two at a time, with either one, two or three flavors of ice cream fed directly from continuous freezers. The filled cartons are automatically closed, and one end is imprinted with the flavor, or flavors contained. Then the cartons are fed onto a packaging table or conveyor for assembly into ½ or 1 gal. units before being placed into the hardening room. This machine is not yet in production.

2. A rotary soaker type milk bottle washer. In this washer the bottles are rotated continuously while in the soak tank, during rinsing and chlorination. Basically the washer consists of an alkali solution tank containing an inner and outer vertical cylinder, around which is welded a spiral track that descends on the inner cylinder and ascends on the outer. The track is continuous, curving in at the top of the outer cylinder to join the inner cylinder, from the bottom of which it curves out to join the outer cylinder. Along this track runs an endless chain equipped with vertical rollers bearing on the track, and horizontal rollers bearing on the cylinder. The chain is driven by horizontal sprockets at each level on both inner and outer cylinders. Power is furnished by an electric motor through a speed reducer.



The Rotosoak washer was one of the new pieces of equipment displayed at the first Dairy Industries Exposition held since 1941. Cleaned bottles slide out of bottle cradles (center). Cradles are reloaded with dirty bottles (extreme right).

Mounted on the track and flexibly connected to the chain are bottle cradles that move on two rubber rollers. These rollers serve not only to move the cradle along the track but in doing so, rotate the bottle.

3. A semi-automatic butter patty cutter and embossing machine in which the butter is cut into individual portions, 20, 40, 60 or 80 to the pound, and embossed with a monogram or insignia. A fully automatic machine, which will convert tub butter into individually embossed and wrapped patties, was shown in blue print.

4. A portable hardening tunnel for ice cream. In this tunnel a wide variety of packaged and special ice cream can be quickly hardened. The filled containers are placed in trays that roll on conveyors within the tunnel. Within one hour the ice cream is hardened and can be removed for delivery. In moderate sized plants the finished ice cream may be stored in this tunnel, thus eliminating a hardening room.

5. New equipment for washing sanitary pipes and fittings. These pieces of equipment scrub in a bath of cleaning solution, and rinse with clear warm water.*

New Packaging

A number of products were displayed for the first time at Atlantic City. Among them were:

1. A parchment lined aluminum butter wrap. This wrapper has been tested by a large butter producer and found superior to the wrappers commonly used in the prevention of the absorption of flavors and odors, and as a protection against mold and moisture losses.

2. A milk bottle cap of laminated paper and aluminum foil that gives pouring lip protection and eliminates the need for an inner cap.

3. A preformed metal milk bottle cap that is applied in a single operation by a capping mechanism that fits on the filler. This cap comes in sizes to fit 38 and 45 mm. bottles.

4. A transparent wrapper for cheese that adheres closely and seals tightly to hold in natural moisture and prevent mold formation. This wrapper can be attractively printed to aid point-of-sale merchandising.

* For further information on these items see "New Devices Improved Cleaning and Effect Savings", *Food Industries*, vol. 18, No. 10, 74-78, October, 1946.

INSULATING YOUR CEILING

One of the most difficult problems involved in building refrigerated storage rooms is proper insulation of the ceiling. In this article, methods of installation applicable to numerous conditions are given

By CLYDE H. MINSTER, Dairy Production Engineer
Caro-Maid Ice Cream Co., Dillon, S. C.

ANY insulating job, measured by dollars and cents outlay, is costly. A poorly installed job costs just as much as a properly installed job. In addition, the deficiencies in the poor job will show up in increased costs of operation and maintenance.

Based on the fact that insulation, like a chain, is only as good as its weakest link, it pays to give the utmost attention during installation to that potentially weakest link —the ceiling.

The problems involved are concerned not only with the structure and strength of the deck that will support the ceiling insulation, but with the difficulties encountered in applying the insulation itself. These latter difficulties are particularly pronounced if the insulation is to be applied to the under side of the ceiling deck. The application mechanic must work overhead, with insulation that has been dipped in hot asphalt, and apply it so that there is a continuous bond against the deck or the previous layer of insulation, with no open cracks between sheets in the same layer.

Many Types

There are many types of ceiling deck installations. There is not always a choice, unfortunately, as to the type that is used. The construction of the building, in which the insulated room is to be located, often dictates the type of ceiling deck.

The following discussions and sketches are intended to assist in selecting the ceiling deck that will best suit your requirements, and in following the construction with some knowledge of how it should be done. No attempt has been made to cover all types of decks, but those covered are among the most common.

The first type deck we will consider is used where the room to be insulated is under a concrete roof deck or a reinforced concrete floor, and where the available height is not sufficient to permit the installation of a false deck. Fig. 1-A illustrates this type of construction.

The first step is to determine the condition of the surface. If it is uneven, it must be plastered with portland cement plaster. After drying thoroughly, the ceiling is painted with asphalt priming paint and this paint permitted to dry.

Since the asphalt, or other bonding material, does not provide sufficient bond to warrant complete dependence upon it to support the entire ceiling insulation, some more positive means must be provided.

Use of "Stripping"

Wood strips, dressed all four sides, are sized full 2 in. square. These strips are securely fastened to the ceiling by the use of expansion screws or bolts, or by Rawl drives. They are spaced just far enough apart to admit a sheet of insulation 12 or 18 in. wide. The heads of the screws or bolts must finish flush with the wood. The strips are painted with asphalt priming paint and permitted to dry.

Two inch sheets of insulation are then dipped in hot asphalt and inserted between the wood strips, toenailing into each strip. The second layer is dipped in the same manner and nailed to both the wood strips and the first layer of insulation.

The strips can be made to project from the ceiling 3 inches and 3 in. insulation used for the first layer. Experience appears to indicate, however, that this type of ceiling should start with 2 in. insulation and contain not less than three layers. The final layer should be sealed with two coats of a good finish, such as mastic or portland cement plaster.

If care is exercised in the application, and the concrete against which it is applied does not develop cracks, an efficiently insulated ceiling should result. Labor costs in installing are high.

Under Wood

Two types of ceiling construction are commonly used when applying insulation on the under side of a wood deck. Fig. 1-B, shows construction where the room width is not too great.

Joists are supported in the building walls and tongue and groove sheathing nailed to the under side of the joists. In some instances the use of building paper between the insulation and the sheathing is recommended. The advisability of this is open to question. There is some indication that, if paper is used at all, it should be applied on top of the sheathing, where it will not interfere with the hot asphalt making a bond between the insulating material and the wood deck. This bond materially assists in supporting the weight of the insulation.

With all the insulation laid up in hot asphalt, the first layer nailed to the sheathing and each succeeding layer nailed or fastened with wood skewers to the preceding layer, a well constructed ceiling will result.

Where the size of the room requires, a suspended ceiling, such as shown in Fig. 1-C, can be used. This ceiling is usually supported by reinforced roof rafters or special trusses constructed overhead. Installation of the insulating material is the same as previously described.

Many of the problems encountered can be minimized if the insulation can be applied on top of the sheathing instead of against the under side. Fig. 1-D shows one example of this type.

The ceiling deck is hung by

means of metal rods. The top of the rods are bolted through channel irons, timbers, or other suitable supports provided overhead.

The bottom of the rods extend through timbers, which are held in place by means of washers and nuts. These rods are usually spaced on 4 or 6 ft. centers each way, depending on the weight of the ceiling and the strength of the overhead supports. The sheathing is nailed to the top of the lower timbers, and the insulation is laid on top of the sheathing.

The insulation on the walls is run before the ceiling deck is hung. The sheathing is then cut to fit inside the wall insulation and the top of the sheathing is adjusted to be flush with the top of the inside layer of the wall insulation. The first layer of ceiling insulation extends over one layer of wall insulation as shown. This gives a good corner joint.

The advantages of being able to lay the insulation on top of the sheathing are worth considerable extra effort. The ease of laying it in this manner should produce tighter joints and more even work. One caution is to be sure the supports for the rods are capable of carrying the weight without sagging.

The main disadvantage of hanging a ceiling with metal rods is that the metal must go through the insulation. The rods should be thoroughly insulated or water will condense on the metal and follow down into the insulation. A fabric and asphalt flashing, tied tightly to the rods, is satisfactory.

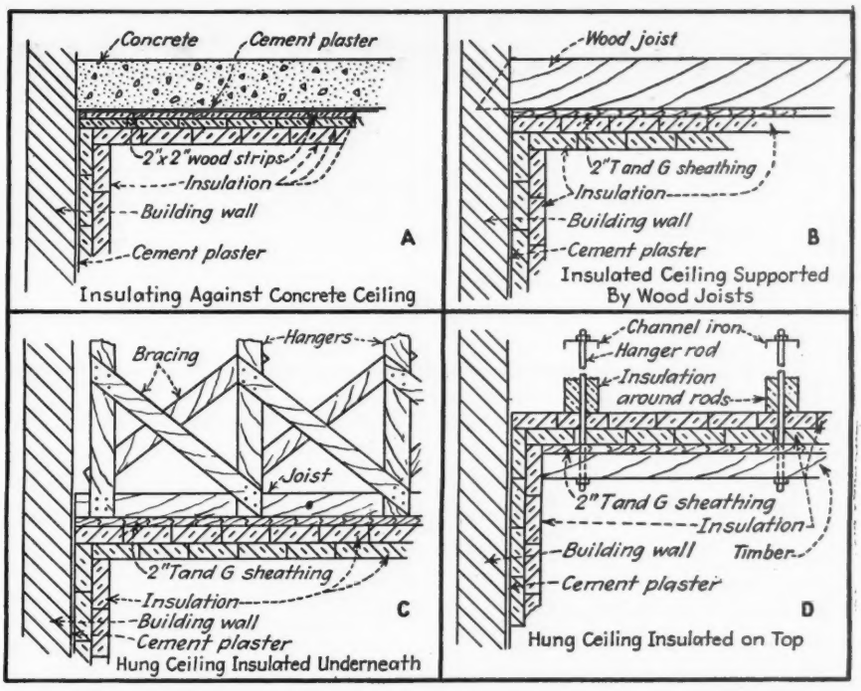


Fig. 1. Types of insulated ceiling construction. A—Insulation applied directly to the underside of concrete floor or ceiling. B—Insulation applied directly to the underside of a wood ceiling or deck. C—Where the size of the room requires, a suspended ceiling can be used. D—Insulation applied on top of wood sheathing.

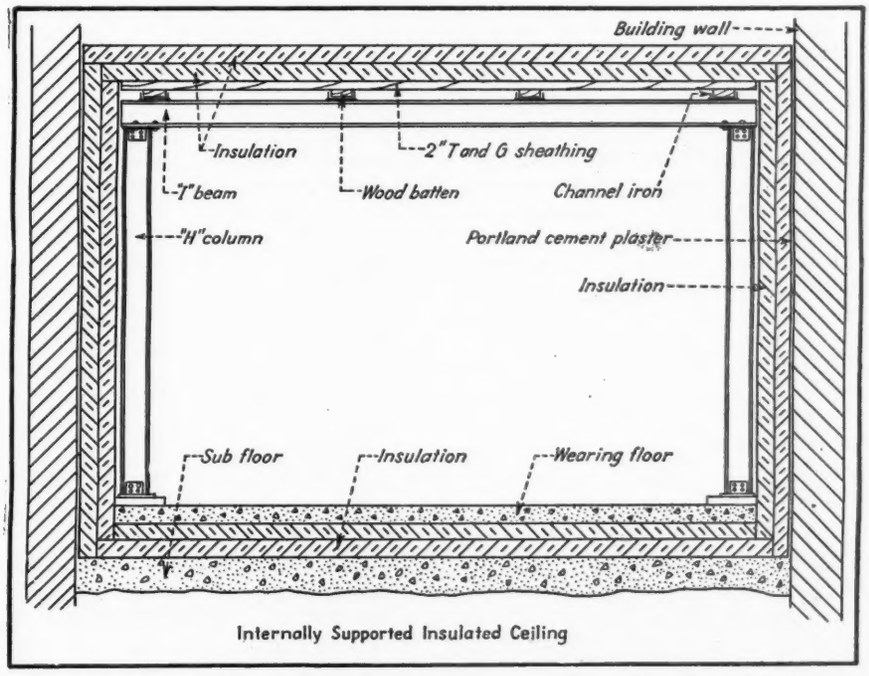


Fig. 2. Method of insulating ceiling with a minimum possibility of failure. The walls and floor are insulated first, and the wearing floor is poured before any work is done on the ceiling. A steel framework is supported on the wearing floor and the insulation is applied on top of sheathing, which is laid on the framework.

On Steel Frame

Fig. 2 illustrates another method of supporting insulated ceilings. In this type of construction, the ceiling is supported entirely from within the room. The insulation is as continuous as possible all the way around the room and no supports extend through it at any point.

The walls and floor are insulated first and the wearing floor is poured before any work is done on the ceiling. A steel framework is supported on the wearing floor. The size and type of steel depends on the load to be carried and this is determined by the area and thickness of the ceiling.

The illustration shows an "H" column at each side of the room. The columns support an "I" beam across the top. These supports are placed at required intervals throughout the length of the room. At right angles to and on the top of the "I" beam, channel irons are welded in place. Wood sleepers or battens are laid in these channels and the sheathing nailed to the sleepers. The sleepers can be bolted to the channels if desired.

The insulation is laid on top of the sheathing in the same manner as described above. The top of the insulation should be flooded with hot asphalt or sealed with some other moisture proof sealer.

This type of construction produces a permanent insulation with a minimum possibility of failure.

How To Improve Low Grade Sweeteners

By the use of filter aids—alone, or in conjunction with activated carbon or ion exchange resins—the color, flavor and ash content of low grade sirups may be greatly improved, making them available to supplement scarce sugars

By W. J. NELSON, Johns-Manville Sales Corporation, New York, N. Y.

SHORTAGE of the usual grades of refined sugars and sirups has resulted in a pronounced increase in the import and production of all sorts of low grade carbohydrate substances having sweetening power. The main types of these materials are given in Table I, although some products appearing upon the market may be blends of two or more types. There are, in the main, four characteristics which may make these sirups undesirable for use—excessive color, haziness, poor flavor and high ash. The flavor and ash may be inversely related.

Besides the sirups listed, such diverse sweeteners as those prepared from tapioca, potatoes and honey are occasionally available.

Not every user requires a colorless, flavorless, clear, ash-free material, but any process for the improvement of any of the qualities in question demands that the sirup first be clarified, that is, freed of solid suspended particles. These suspended particles, usually colloidal, consist of insoluble mineral compounds, gums and broken down cellulose and nitrogenous debris from the original natural material, either cane or grain. If an attempt is made to clarify these sirups in the usual manner (by pumping through cotton filter cloth) very poor results are obtained. The cloth quickly becomes clogged with the removed colloids and flow almost ceases. What filtrate is obtained is not clear. These same filtration difficulties would be met in the regular production of cane and cereal sirups were it not for the use of diatomaceous silica filter aids.

Diatomaceous filter aids are finely divided, porous, light weight, inert powders. The particles are of very diverse shapes as can be noted from the photomicrograph (Fig. 1). In practice, a certain amount of filter aid is kept in suspension in the liquid fed to the filter. There the filter aid is removed as a cake upon the face of the filter cloth, and at the same time the suspended impurities are completely trapped and retained in this cake. Thus, the impurities are kept away from the cloth. In addition, as the liquid continues to pass through the cake, a homogeneous and porous mixture of cellular filter aid particles and the suspended solid impurities gradually builds up. The cake thus increases in thickness, constantly presenting a fresh surface to filtering action.

Commercial filter aids are obtainable in various degrees of fineness. It is obvious that greater filter output would follow the use of the coarser types. On the other hand, coarser filter aids might not retain some colloidal suspensions. The proper filter aid is a matter of test.

Most of the sirups under consideration have a density of between

TABLE I—Low Grade Sweetening Agents

Type	Source	Color	Flavor	Haze	Ash %
Blackstrap.	Cane	Dark	Poor	Bad	10–12
Molasses...	Cane	Medium	Fair	Light	8–12
Invert.....	Cane	Dark	Poor	Bad	2
Invert*....	Grain	Medium	Fair	Medium	Low
Invert**...	Grain	Fair	Fair	Light	Low

* Enzyme.
** Acid.

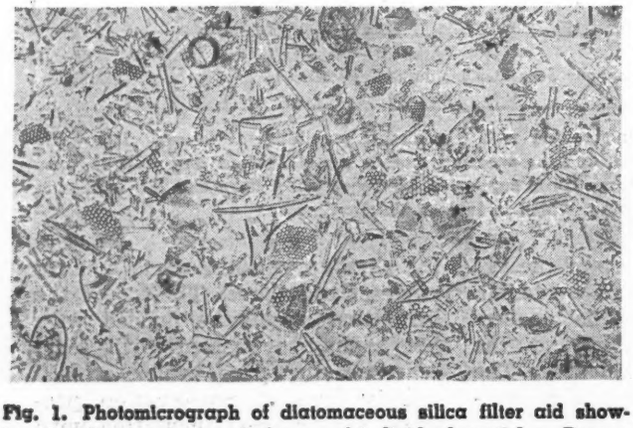


Fig. 1. Photomicrograph of diatomaceous silica filter aid showing the diverse sizes and shapes of individual particles. Degree of magnification 600.

TABLE II—Average Practice for Clarification of Various Sirups

Type	Filter aids	Percent filter aid based upon solids	Flow rate gal./sq. ft. per hour	Remarks
*Blackstrap.....	Hyflo Super-Cel Celite 503	1.0–2.5	0.5–1.0	at 185° F.
Molasses.....	Std. Super-Cel Hyflo Super-Cel	0.2–1.0	1.0–1.5	at 185° F.
**Invert-Cane.....	Hyflo Super-Cel Celite 503	2.0–4.0	1.0–5.0	at 185° F.
Invert-Grain.....	Hyflo Super-Ce Celite 501	0.2–1.0	2.0–4.0	Enzyme Inverted
Invert-Grain.....	Standard Super-Ce Hyflo Super-Cel	0.1–0.5	2.5–7.5	Acid Inverted
Honey.....	Celite 512 Hyflo Super-Cel	0.5–1.0	2.0–5.0	160° F. Max. Temp.

* The quality of the filtrate will be improved considerably if the sirup is diluted and treated with 0.01 to 0.05 percent P_2O_5 based upon solids. After thorough agitation, the sirup is brought almost to neutral with soda ash and filtered.

** Before filtration, dilute to 40 deg. Brix, treat with 0.005 to 0.01 percent P_2O_5 at 185 deg. F and filter without neutralizing.

THREE ANNOUNCEMENTS IMPORTANT TO YOU

I. West Coast Section

If you live west of the Rocky Mountains in continental U.S.A. you will, commencing next month, receive in each issue of FOOD INDUSTRIES a section devoted to strictly western news, trends and developments. This is in addition to the regular issue, which will be unchanged in any way, and will carry the news of national importance. There will be no extra cost to Western subscribers.

Subscribers who live east of the Rockies can receive the West Coast section by payment of a small reprint fee.

C. R. Havighorst, Associate Editor of FOOD INDUSTRIES, will edit the western section from our San Francisco Office, 68 Post Street.

II. Frozen Foods—Report No. 2, Frozen Food Survey

In January and February, 1947, FOOD INDUSTRIES will publish two special sections of about 36 pages each, including 2 large maps in color, covering frozen food production and distribution. These sections are a joint effort of the Refrigeration Research Foundation and FOOD INDUSTRIES. H. C. Diehl, director of the foundation, and C. R. Havighorst are the authors.

In March, 1945, they presented Frozen Foods Report No. 1, on frozen foods, which showed clearly the potential expansion of the frozen food industry.

Don't permit your subscription to lapse, for the price of these issues is $1.00 each *vs.* $3.00 a year for the magazine.

The combined reprints of Report No. 2 (the January and February sections) plus Report No. 1 will be available at $1.25 each (in lots of 10 or more at $1.00 each).

III. Frozen Food "Package"

After March, 1947, we shall have available a Frozen Food "Package" including reprints of Report No. 1, Report No. 2, the 1947 Frozen Food Directory, and the check list entitled, "So You're Going into Freezing," that points out the questions management must consider. The package will sell for $3.00. (In lots of 10 or more the price is $2.50 each.)

Price of the Directory alone is $0.75—or in lots of 10 or more—$0.50 each. It will not be printed in the magazine.

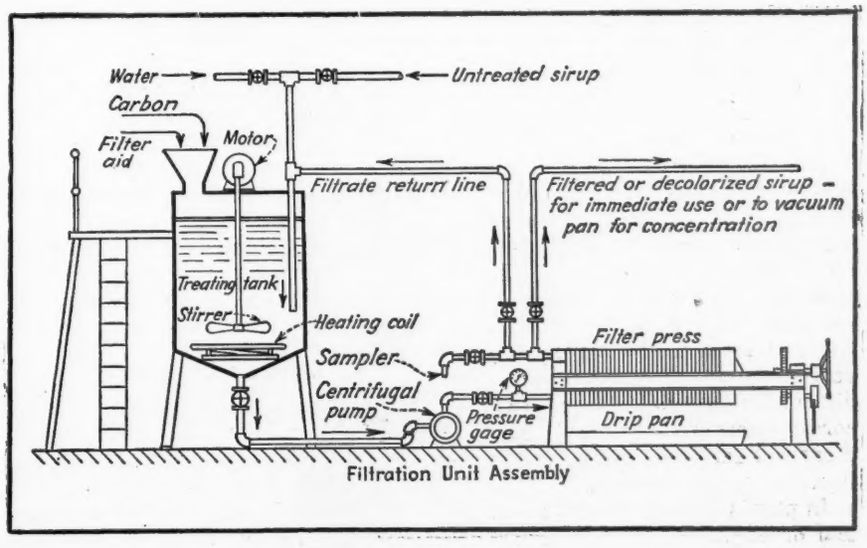
78 and 84 deg. Brix or 42 and 45 deg. Be. The highest density at which filtration is ordinarily advisable is about 65 deg. Brix or 36 deg. Be, but often the density must be reduced to 40 deg. Brix or 22 deg. Be. Hyflo Super-Cel* is preferable at the lower densities and Celite 503* at the higher densities. Where a high degree of clarification is impossible with those filter aids, a considerably finer one, such as Standard Super-Cel*, must be used. Density should then be reduced to at least 55 deg. Brix, 30 deg. Be.

The use to which the finished sirup is to be put determines the processing necessary. Simple clarification with filter aids followed by reconcentration, if necessary, yields a brilliantly clear sirup with little change in color, flavor or ash.

The use of phosphoric acid usually results in some improvement in color and flavor. Additional improvement in these qualities, as well as considerable ash removal, follows treatment with activated vegetable carbons or ion exchange resins.

Reasonably clean sirups, such as the grain sirups or partially refined molasses, may require as little as 0.25 percent of activated carbon, but very dark sirups may require up to 5.0 percent based upon total sugar solids. It is often necessary to use additional filter aid—up to the weight of the carbon used—in order to filter out the carbon.

Ion exchange resin treatment has been used experimentally to produce light colored or bland sirups of very low ash contents. When run through ion exchange systems, sirups must be diluted to 30 to 40 deg. Brix—16 to 22 deg. Be. If a clear sirup is required after reconcentration, refiltration with a low filter aid dosage may be necessary. A very efficient purification system for cane and beet sirups would involve the ion exchange operation followed by a moderate activated carbon treatment and filter aid clarification.



Flowsheet of suggested layout for the processing of low grade sweetening sirups. After the sirup has been diluted to the proper specific gravity, and heated to the desired temperature, the filter aid is added. Agitation of the mixture is maintained throughout the entire operation to keep the filter aid in suspension.

* Identifies filter aids made by Johns-Manville Corporation.

How Packaging Problems Are Tackled in Food Plants

To solve your problems, work out details with operators and supervisory personnel, investigate materials and equipment available, make a study of operations and see what effect your changes have on other departments

By F. W. TOOF, Chemical Engineer, Niagara Falls, N. Y.

IN solving any packaging problems in modern industry today, it is necessary to have a thorough understanding of materials and equipment involved. Packaging knowledge is obtained by years of experience through actual work and experimentation with a variety of food products, packaging materials and equipment. With the numerous improvements in materials and manufacturing equipments which are being made almost daily, it is necessary to keep in constant touch with all phases of the food industry, so that products may be produced efficiently at lowest cost and highest quality.

Study of Problem

After a study of the operations and a thorough discussion of the details by both the operators and the supervisory force, the problem should be outlined as follows: (1) Detailed statement of the problem, (2) work necessary to solve problem and (3) conclusions. To determine the work necessary, the materials used and the operations conducted must be investigated separately. Information is gathered by searching files, consulting plant or other libraries, experimenting on desired phases not covered by the above and recording all pertinent data. Operation studies should include: (1) Investigations covering operating difficulties experienced and (2) recording changes or alterations necessary to solve the packaging problem.

In plants that do not have a chemical or engineering department capable of handling packaging problems, it will be necessary to obtain aid either from standard equipment companies or from consulting engineering firms, or both. Today most large companies and a number of small ones have highly efficient staffs capable of handling all packaging problems.

For effective solution of packaging problems, those individuals entrusted with the problems must be acquainted with material available for use in their work. This knowledge may be obtained from the suppliers or from actual users of the product. Attendance at packaging conferences and expositions, meetings of the Packaging Institute and the Technical Association of the Pulp and Paper Industry, conversations with sales engineers, and lectures given by well known authorities will broaden their knowledge and increase their contacts. Reference books, packaging catalogs and trade and professional journals are other valuable sources of information.

In solving any problem relating to packaging, thoughts and suggestions from the operator must not be overlooked. Actually, the operator is closer to the problem than anyone else. It is he, who, in many cases, suffers a loss of pay when production is halted due to faulty packaging. Frequently, the operator can furnish valuable leads, resulting in the problem's ultimate solution.

Looking for Leads

Because no satisfactory solution is reached after undertaking a problem, an investigator must not accept defeat. Reports should be carefully studied and, if possible, previous investigators must be contacted for possible aids or leads for the problem's ultimate solution.

Packaging problems sometimes originate with the sales department. Requests are made for newly developed, packaged products. Newly designed or constructed packages are often requested to increase sales appeal. Undesirable features found in existing containers are often brought to the attention of the sales force through complaints. On one occasion, complaints were received from retailers and consumers on the condition of packaged shortening. Despite the fact that supposedly greaseproof cartons were used, they were soaked with grease. A thorough investigation revealed pin holes in the seams of the cartons.

Development Problems

Packaging problems sometimes originate in the development of new packaging materials. Before any new packaging material can be used, its characteristics must be fully known and studied. These will include such factors as: (1) Water resistance, (2) oil resistance, (3) flexibility, (4) color, (5) odor and (6) melting point of wax coating. The exact characteristics desired are dependent upon the purpose for which the packaging material will be used.

Before adapting new material, complete experimental work must be carried out. Where a new liner for a cap for an edible product is being investigated, caps lined with regular material should be tested simultaneously. Caps lined with regular and test materials must be placed on bottles that are filled and capped according to regular plant production methods. Bottles should then be turned bottom side up and held in constant temperature rooms. Low, medium and high storage temperatures are recommended. Periodic examinations will reveal any

evidence of leakage, deterioration of liners and impartation of odor or flavor to that product.

As a further example, assume that a product is to be packaged in a two-piece Lambert style carton. This carton consists of an inner one-piece folding sleeve and an outer 4-sided sleeve into which the inner sleeve slides. In changing from hand to mechanical banding, the carton will not lend itself to rapid packaging. A one-piece container with top and bottom flaps, on the other hand, will be quicker and easier to package, with a corresponding reduction in container cost.

Reducing Operating Costs

Sometimes packaging problems may be encountered as a result of attempts to reduce production costs or increase speed of operation. In one factory attempting to reduce production cost, fewer operators or inspectors seemed to be required. Apparently these individuals had excess "free time." It was found, however, that they had been performing vital operations. Some had been properly spacing "out of line" bottles or jars prior to filling, capping and labeling. Others had removed cracked glass containers from the line. These operations had prevented subsequent breakage, complaints and loss of good-will.

Increasing the speed of conveyors may often work to a disadvantage. Shortening, filled in jars or cans, may not have sufficient time to solidify prior to turning for the labeling operation. An undesirable condition will then result, for shortening will adhere to the container lid and complaints will follow.

Working Out a Problem

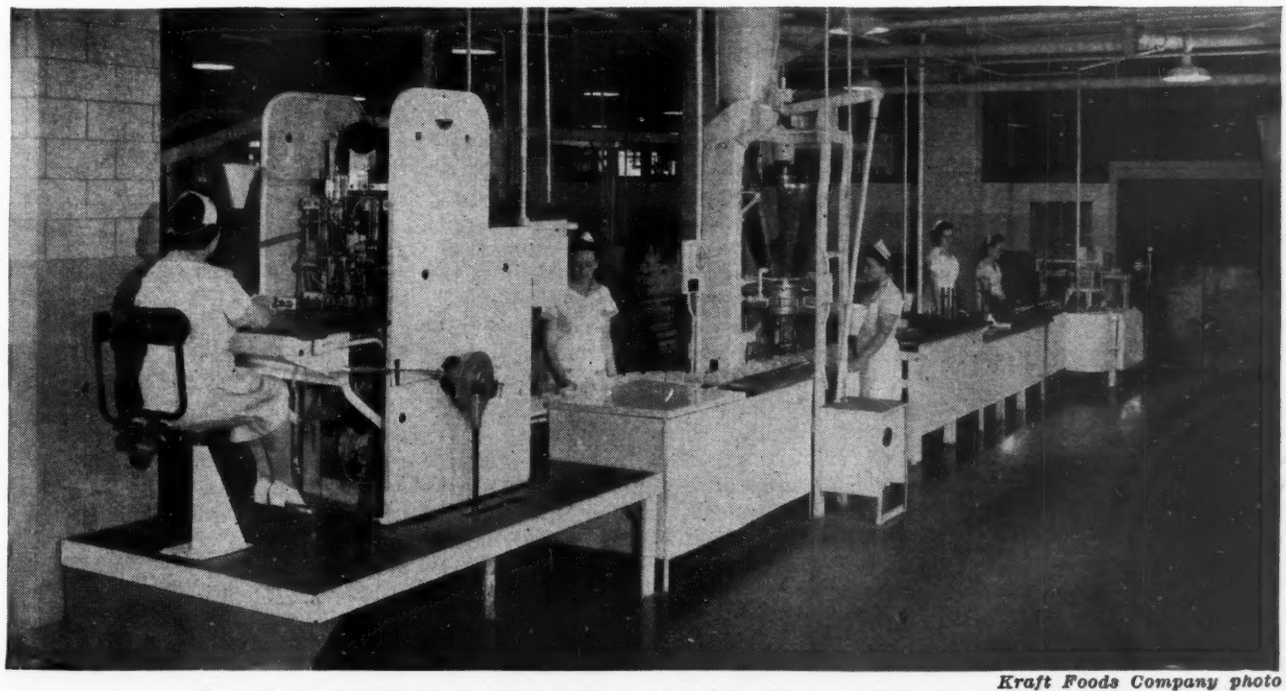
After studying the problem and arriving at a conclusion on possible solutions, it may be desirable to make some mechanical changes. These may be made either by altering present equipment or purchasing new equipment. Prior to this, pertinent facts on equipment must be obtained. Assuming an electric motor is involved, the motor revolutions per minute, voltage, speed, phase and number of wires (2, 3, or 4) must be known. Sketches and detailed drawings of present assembly and proposed alterations should be made for reference and construction purposes. Mechanical alterations can be made in either the plant machine shop or an outside machine shop.

In many cases, consulting service may prove advantageous. Consulting engineers have knowledge of mechanical equipment and operations in several diversified industries. Plant engineers are more familiar with the particular product, equipment and operations in their own plants. By consultation and a survey of all equipment and processes in use, many hours of unnecessary experimental work are frequently eliminated.

In solving packaging problems, the effect of the operation on other departments must be considered. To illustrate this point, we may take a hypothetical case of a production department that solved its inefficient container packaging problem by increasing the weight of the material per container from 25 to 62 lb. As several women were employed in the shipping room, this meant that the weight of the container was too heavy for female handling. While one problem was solved, another was created.

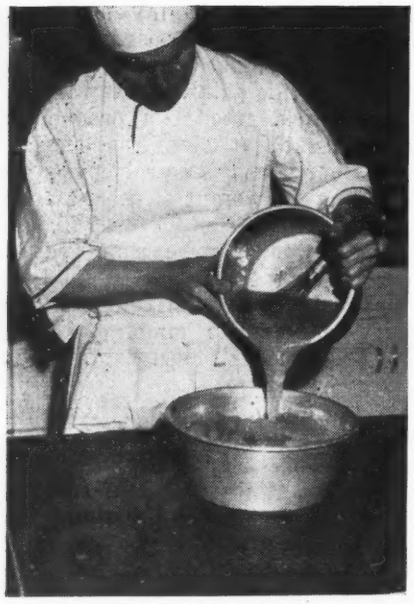
Most large companies have numerous problems on which their staff members are working simultaneously. This group of investigators is headed by someone who can efficiently assign the work and keep in touch with its progress, to assure the earliest, satisfactory solution. An efficient organization minimizes duplication of effort. Those investigators who are working on the problem must always bear in mind that they are not merely seeking a solution but the best solution from an operation and management viewpoint.

Before submitting any recommended changes in new packaging materials or existing packaging operations to the operating department, proposed changes must be worked out in the plant. Recommended packaging materials will determine how efficiently packaging machines work. Efficient operation must be kept constantly in mind.



Kraft Foods Company photo

Over-all view of half-pound cheese packaging line that reduces production cost by operating at high speed. (Left to right): Bag-former, filler, sealer, closure and packing units.



Premium ingredients should always be used for frozen pies and other pastry. Rancid and off-flavored products result if any second grade ingredients are added.

Prior to adding the fruit filling, an even layer of granulated sugar is spread on the top of the bottom pie crust. In this manner soggy pie crusts are easily prevented and a more even sugar distribution occurs. Pies made in this manner have a smoother and more uniform flavor than when sugar sirups are used for sweetening.

Tips on Frozen Pastry

A program, set up by a public utility to test a complete line of frozen baked items, pioneered the way for food-service organizations in a new specialty field. Practical tips resulted in superior quality products

By MISS ESTHER LEE BRIDE, Home Economist
Union Electric Co., St. Louis, Mo.

FROZEN bakery products, both baked and ready-to-bake, have been rapidly making their appearance during the past year. The idea is not new. But, there seems to be a better chance of success and wider acceptance at this time because of developments in freezing equipment, freezer storage and distribution facilities.

In 1943, the Home Economics Department of the Union Electric Co. of Missouri conducted experiments on frozen bakery products with the object of helping housewives maintain adequate food supplies during wartime shortages. Through the purchase of frozen pies and doughs from bakeries, housewives could prepare baked goods when needed without waste or effort. Since that time, several bakeries, restaurants, catering firms and other food-service organizations, impressed with the results of these tests, began freezing bakery products.

The utility has complete kitchen classrooms and deep freeze units used for regularly scheduled classes for housewives, economists and club organizations. Averaging four classes a week, the home economics staff of 25 women has been developing new practices in food preparation. The classes were set up because many women were buying home deep freezers or renting lockers and mishandling frozen foods. All types of frozen foods have been tested, with the emphasis, however, on quick freezing pies, rolls, stollen doughs and cake doughs. Along with developing good methods of quick freezing doughs, it was found necessary to teach students how to use quick freezing equipment efficiently. In this undertaking, the utility recognized unfamiliarity with the refrigeration equipment as a possible retarding influence in the acceptance of frozen foods by housewives.

The tests involved freezing six prebaked and six unbaked pies at a time. These were held one month at low temperatures and then thawed. Frozen, unbaked pies were baked for 60 minutes at 375 deg. F., cooled and compared with thawed, prebaked pies. A panel of 15 home economists graded the pies for color, crust texture, fruit texture, smoothness of flavor and shortness of crust. Tests were conducted approximately eight times before conclusions were reached. Evaluation slips were filed and have been referred to by bakers, other food organizations and housewives. Ten varities of pies had been frozen and held in storage for over a year.

From the housewife's standpoint,

the utility found prebaked, frozen pies unsatisfactory. It was felt that slow and careful defrosting of frozen, prebaked pies was too exact a process for the housewife to follow. Tests showed that frozen prebaked pies steamed badly when heated in the oven. Furthermore, the fruit filling broke down into a soft, homogeneous mass, and the crust softened and lost its crispness. Prebaked pies did not have the fresh, active flavor of the type baked after thawing. Frozen unbaked pies, however, were tasty when baked.

Premium Ingredients

These tests furnished many practical tips to bakers. In the first place it was found essential to use premium ingredients for frozen pastry, whether baked or unbaked. Second grade ingredients resulted in rancid, off-flavored products. By spreading a layer of sugar in place of sirup on the bottom of each pie crust before adding fruit filling, soggy pie crusts were eliminated and more uniform distribution of sugar resulted. In addition, pies had a smoother and more uniform flavor. For the same reason, butter was mixed with the fruit and fruit juices.

Another important contribution was the development of a "floating pie crust." By making the top crust ¼ inch smaller in diameter than the pie, steam escaped during baking. This prevented rupture of the top crust and damage to the fruit, particularly berries. Spices could not be used in fruit fillings because of discoloration and rancid flavors encountered.

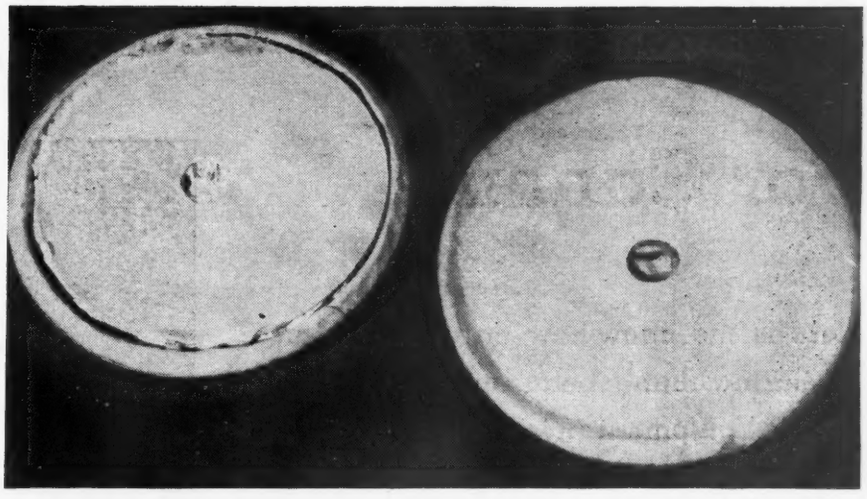
Packaging

A total of nine varieties of wrappers, including plastic films, waxed papers and various locker wrapping papers were tested for the frozen pies. Packaging materials were tested to determine if suitable protection was provided against discoloration, moisture absorption, dehydration, off-odors and off-flavors. A white, vapor-proof, moisture-proof, paraffin-lined cardboard carton was found satisfactory. Frozen pies were also successfully packaged in a moisture- and vapor-proof cellophane with a stockinette overwrap.

A specially developed cardboard pie plate is now being used for the frozen pies. It consists of a parafin-finished paper with a reinforcing metal rim.

Tests were also conducted on quick frozen doughs for rolls, biscuits, cakes and other baked goods. It was found that ingredients influenced the keeping quality of doughs in the frozen state, as well as on reconditioning after freezing and in the oven. One main objective was to reduce the amount of yeast that bakers found necessary for frozen doughs. Generally speaking, twice as much yeast has been added to frozen doughs as to fresh-baked goods. This has resulted in a yeasty flavor together with other disadvantages likely to influence the popularity of frozen doughs. The utility has been conducting tests so that ultimately the amount of yeast can be reduced to standard proportions. Yeast, used in frozen doughs, will require considerable research to determine the proofing time required and the action of yeast on sugars and other ingredients during low temperature storage.

Further experiments on frozen pastry are being conducted by the utility. Findings of practical significance are constantly being developed to improve the quality of frozen bakery products.



A floating pie crust, shown on the left, facilitates escape of steam during baking. Rupture of the top crust and also leakage of sirup and fruit juices are prevented.

Grading Test For Powdered Milk

Here is a simple method of evaluating the quality of powdered milk that should be of value to all users

By ALFRED E. LEIGHTON,
Sweets Company of America, Hoboken, N. J.

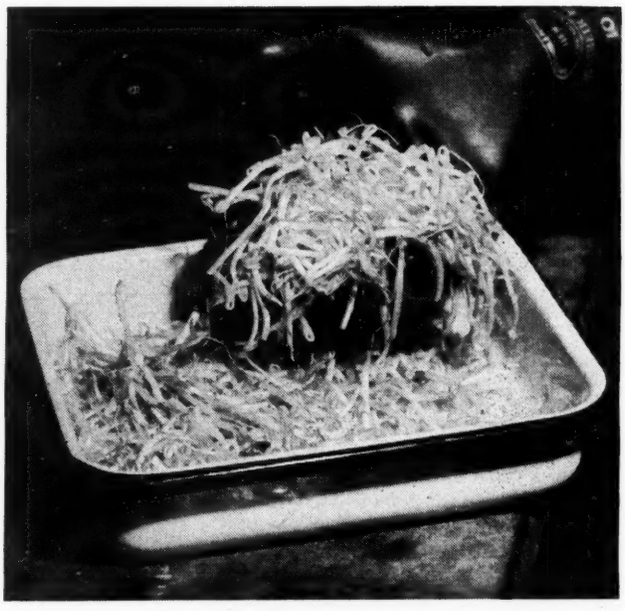
INTO a suitable assembly of sterile flask and cover, introduce 100 ml. of sterile distilled water. Add 10 g. of powdered milk, weighed out with the usual bacteriological precautions to prevent contamination. Swirl flask and contents to assure dispersion and solution. Allow to stand at room temperature (68 to 70 deg. F.) for spontaneous development of acidity and coagulation, which takes place in from 48 to 72 hours. During the first 24 to 48 hours the flask and contents may be gently swirled occasionally to ensure uniform development of acidity and coagulation.

A good grade of powder should produce a coagulum that is smooth and uniform in appearance, and one that adheres slightly to the sides of the container without separation. It should have a clean, fairly sour aroma and taste. When lifted with a spoon it should leave a clean cut mark in the surface. A curd that floats on top of the liquid, contains gas holes, has an unpleasant smell or unclean taste, or pulls away in a stringlike manner, is not favored even if it has a low bacterial count. Results of this test are interpreted in a manner similar to that used by a creamery man to evaluate starters for making butter or for producing cultured milk.

Growing Mung Bean Sprouts For Canning

Here is the know-how on growing and preparing mung bean sprouts for canning. Equipment needed is fully described in this article written by an authority on oriental food processing

By W. F. Kuhn, Consultant
Oriental Food Products Service, St. Louis, Mo.



Fully grown and washed, these sprouts are ready to be canned. They are quite brittle when they come from the washing tank and will break during canning unless they are given a short blanch beforehand.

IN the past ten years there has been a considerable increase in the use of mung beans for growing bean sprouts and canning them for the American trade. Ten years ago there were but five or six packers of Chinese food products in the entire country and for any one firm to grow and process as many as 5,000 pounds of bean sprouts in one day would have been considered a very large production. Today there are from 20 to 25 packers in the business and, only recently, I visited a plant which packs 2,000 cases of 2 1/2 bean sprouts daily, using between 15,000 and 20,000 pounds of bean sprouts daily or 100,000 pounds weekly.

The mung bean, like the soy, is of very early cultivation, dating back long before the annals of man. It originated in Southern Asia and the Malayan Islands, later traveling to the eastern portion of Africa and Greece, and coming to this country by way of the West Indies. Mung beans are a smaller variety than the soy and are generally preferred for sprouts.

Before 1940, obtaining supplies of mung beans was a relatively simple matter as those used were imported from the Orient where they were plentiful and of good quality. However, the Japan-China war eventually cut off this supply. Some mung beans had been grown in this country but only for forage purposes. In order to grow them for commercial canning, the American farmer had to overcome many difficulties. Beans are harvested by hand in the Orient as labor costs are low, but the cost of that method would be excessive in this country. Several years of experience have proved helpful, however, and now suitable beans can be obtained from Oklahoma and other states. Mexico recently has entered the field of growers. supplying beans of very good quality as its labor costs are lower and most of the harvesting can be done by hand. The cost of the Mexican beans, however, runs from 5 to 10 cents per pound higher than domestic ones.

Mung beans can be sprouted in many types of containers, and in various kinds of places. They have been sprouted in stone jars, metal cans, wooden kegs and cement vats, in basements, first and upper floors, with and without windows and at various temperatures. They can and have been grown in various periods of time ranging from 3 to 10 days, but each method produces a difference in the size and quality of the sprouts. A good bean sprout should be 1¼" to 1½" in length and with a diameter of ⅛" to 3/16". All sprouts in any one container should be equal in size, from the bottom to the top, and there should be none of the so-called "toppers," or sprouts that must be discarded.

Simple Procedure

The processing method explained in this article is a simple one. It will produce uniform bean sprouts of exceptional quality. The method may be enlarged to suit any desired production requirements.

The selection of a place in which to grow bean sprouts is very important and has a direct bearing on the quality of sprouts which can be produced. The most suitable place is an underground basement without any outside light. Very little ventilation is needed because of the use of large quantities of water.

The basement should be shut off from any contact with the rest of the building, such as elevator shafts and stairways. Such a place will retain a fairly even temperature, usually about 65 deg. F., the year round without any heating. Heat will be required only in extremely cold weather, and then a small blower type heater will answer the needs. Similar conditions can be secured in other parts of a building but it would require insulation and air-conditioning. The hot water tank, needed to supply

the water during the growing period, should be installed in another part of the building, but if it must be placed in the growing room, it will have to be very heavily insulated. The lighting in the growing room should be dim or just enough to find one's way. Light for inspection and watering can be obtained by the use of a wrist type flashlight. All other operations, such as washing sprouts, should be done in another part of the building, as they require the use of bright lighting.

For many reasons, the best type of container in which to grow bean sprouts is a stone jar. Jars are sanitary and can be cleaned quickly by applying live steam. Being heavy and thick, they will retain temperatures. Owing to the highly glazed surface they are far better than containers of any porous material, such as wood or cement. Metal will rust or corrode and in time cause contamination. Also, riveted or soldered seams are difficult to keep sanitary. Various containers can be used, but the round type with an equal width and depth, not exceeding 30 inches, is to be preferred because the outer edge is the same distance from the center at all points. In square or rectangular containers the corners and sides are different distances from the center, and the sprouts in the corners will be smaller than those on the sides. When the depth of the container exceeds the width, the sprouts will not be uniform in size because of too much weight and not enough ventilation.

The stone jars shown in the illustrations are of 20 gallon capacity and were made on special order by a pottery manufacturer who used a 30-gallon mold cut down one-third in order to give the desired width and depth. At the time of molding, a plug was inserted for the hole to accommodate the drainage fitting. The drainage fitting is specially made and is fitted into the hole in the jar. Both the drainage nipple and the solid pipe cap must be watertight, which can be accomplished by using rubber washers. By making these watertight it is possible both to soak the beans and grow the sprouts in one and the same container. Two sets of pipe caps are required, one to be solid, and the other to have a ⅛" hole drilled in the center of the bottom. The solid caps are used while soaking the beans and the others while growing the sprouts.

After the jars are prepared with the drainage fittings they are placed on the racks with the drainage fittings at the lowest point so that they will completely drain at all times.

Before mung beans will sprout they must first have begun to germinate. This is done by soaking them in warm water and washing them so that all foreign material is removed. Washing the beans is accomplished by using two buckets of about two or three gallon size and punching quite a few holes in the bottom of one of them. The proper amount of beans to use in any container is 4 ounces for each gallon of the capacity of the container or 5 pounds of beans for a 20 gallon container.

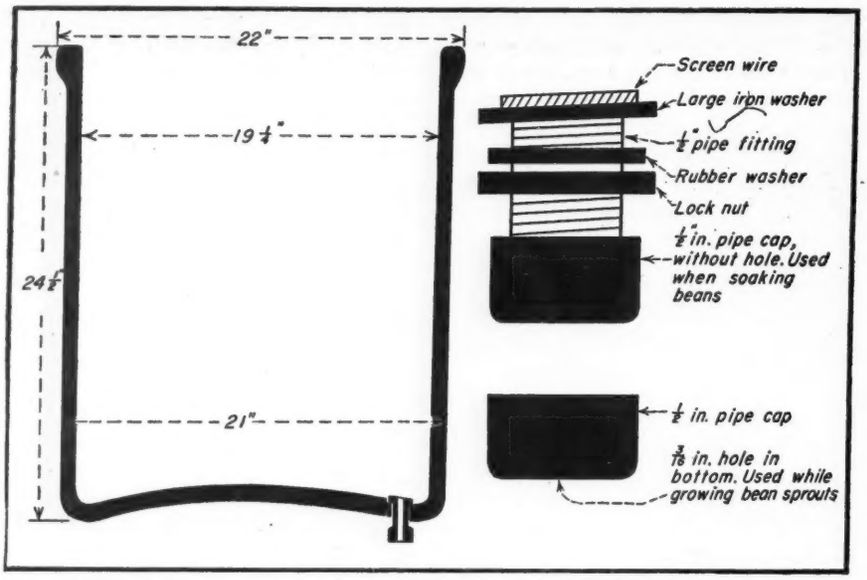
Place the 5 pounds in about one half bucket of warm water of about 90 deg. F. Stir the beans thoroughly and rub them briskly between your hands in the same manner as a housewife washes rice. Then run warm water into the bucket permitting it to slowly overflow. All of the dirt and foreign matter will pass out of the bucket with the overflowing water. Continue this until the water is clear. Transfer the beans into the bucket with the holes in the bottom and allow all water to drain off. Next, place the beans in one of the stone jars which has been thoroughly cleaned. After the required number of jars are prepared with the proper amount of washed beans, run clear water of 90 deg. F. into the jars to the amount of about five times that of the beans, as the beans swell and must be completely covered with water at all times.

Soaking Time

The exact period of time required for properly soaking the beans may be varied from 6 to 10 hours. After the beans are soaked for the necessary length of time, remove the solid pipe cap from the drainage fitting and permit the beans to drain. Flush them several times with clear warm water of 90 deg. F. and again permit them to drain. Smooth the beans over the top with your hands to distribute them evenly in the bottom of the jar. The beans are now ready for sprouting and this last operation may be considered as their first watering. After this, permit the beans to stand uncovered for 8 hours, then cover and attach the pipe cap with the ⅛" hole to

An underground basement is the best environment for sprouting beans. Cylindrical stone jars are highly suitable for the process.

This view of a can closing operation was taken in the plant of Ben Gee Food Products Co., Chicago, oriental foods processor.



A round container with equal width and depth not exceeding 30 inches, is to be preferred for the growing of bean sprouts because the outer edge is equidistant from the center. The drainage fitting is an important accessory to the jar, as it makes it possible to soak the beans and to grow the sprouts in the same container.

the drainage fitting and water the sprouts slowly until the water reaches the top of the sprouts, using water of 90 deg. F. The sprouts are watered in this way every four to six hours until fully grown. After about 72 hours, the water can be run several inches over the top of the sprouts.

The 3/16" hole in the pipe cap will permit enough drainage yet the jars will drain slowly. The advantage of this type of drainage is that all sprouts receive an equal watering. When fast drainage is used, the outer sprouts receive less watering than the center ones, as the water reaches the drain faster.

Watering the Sprouts

When watering the sprouts, it is necessary to place some sort of covering over the top of them, not only to keep the upper ones moist, but also to break the flow of the water used at the various waterings. Sprouts start growing with the roots down and should continue that way until fully grown. If they are disturbed, they will turn and the sprouts will be in various shapes instead of straight. The covering can be made of straw matting, burlap sacking or a piece of screen wire with cloth above and below. It should not fit too tightly in the jar as it must rise as the sprouts grow. Special care must be taken not to disturb the sprouts during the first 24 to 48 hours of growth. A very mild spray of water is used. The sprouts are formed into a mass after about 48 hours and the force of the spray then can be increased.

The following is a watering schedule found to produce very satisfactory sprouts in five days. The beans are soaked overnight from 8 or 9 p.m. to about 7 or 8 a.m. The various periods may be altered according to production and labor requirements. Temperatures of water may also be changed to suit conditions of the sprouting room. Before growing any large quantity of sprouts, it is best to first try several small batches in order to determine an exact schedule.

Watering Schedule

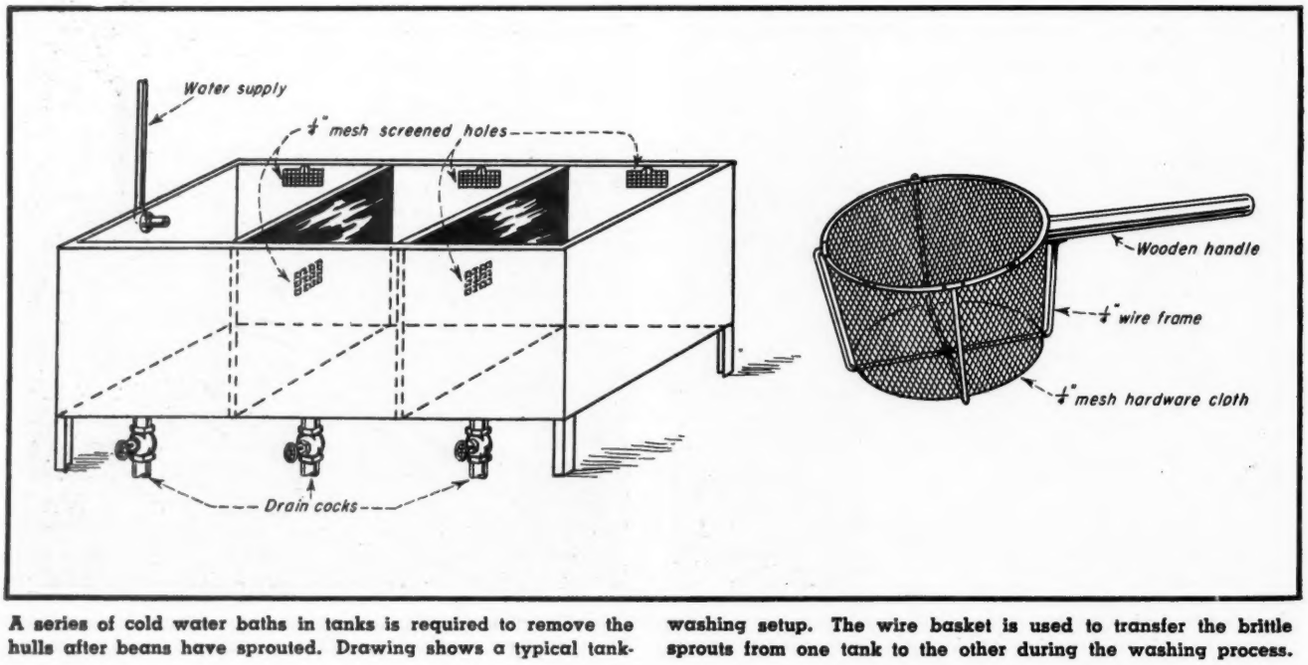
First 24 hours use 90 deg. F. water.
Next 24 hours use 80 deg. F. water.
Next 24 hours use 70 deg. F. water.
Next 24 hours use 65 deg. F. water.
Next 24 hours use 55 deg. F. water.

A good grade of mung beans should produce a yield of at least 8 pounds of sprouts to each pound of beans. From 40 to 50 pounds of sprouts can be grown in a 20 gallon jar.

Dehulling

Fully grown, the sprouts then are washed or put through an operation to remove the hulls, or as many of them as possible. Elaborate and costly machines have been constructed to do this work but most of them are not practical. When

(*Turn to page* 228)



A series of cold water baths in tanks is required to remove the hulls after beans have sprouted. Drawing shows a typical tank-washing setup. The wire basket is used to transfer the brittle sprouts from one tank to the other during the washing process.

New Dispensing Unit For Packaged Foods

Grand Union's Food-O-Mat carries 1,700 items in one-fourth the space, minimizes dust, cuts shopping time one-third, yet allows a customer to change her mind

AN automatic, self-service style packaged food dispenser, called the Food-O-Mat, permits stock rotation in super markets. This new innovation in self-service merchandising may be one of many, to be developed in the near future, that will influence the processor's style and method of packaging. The Food-O-Mat was invented by Lansing B. Shield, vice-president, Grand Union Co., New York City, and was installed in the company's Ridgewood, New Jersey store where it has been in service the past three months. Before the first store installation was made, about a year was spent trial-testing and further perfecting a pilot unit in their Carlstadt, New Jersey warehouse.

Its Construction

The dispenser is 75 ft. long and divided into 22 sections, each about 3 ft. wide. Units can, however, be constructed to lengths depending upon the size of the store. Each section consists of 8 to 12 shelves or trays that are 36 in. wide and 40 in. deep. Shelves are so constructed that they can be horizontal or adjusted to any angle up to 45 degrees. The number of shelves in a section varies with the size commodities serviced. Smaller packaged items, such as spices, extracts and starch or gelatin type flavored desserts require 11 or 12 shelves. Larger packaged items, with greater depth, like cereals and flour need only 8 or 9 shelves.

The main element is the adjustable angle iron on the shelves so that spaces can be adapted to various size packages. Shelves may be adjusted into 5 to 10 slots. Only one variety or brand of food is serviced from each slot. Shelves are within easy reach. They are neither too high nor too low. A stock room is located behind the Food-O-Mat. Here store clerks stock up the dispenser periodically during store hours. Anywhere from a case to a half a case of packaged foods are filled into each slot.

As a customer selects her purchase from the unit, others are fed into position by gravity. If, after selecting her purchase, the customer wishes to change her mind, the item is placed in a return slot near the floor which feeds it back to the stockroom. This procedure eliminates the possibility of mixed stock in the dispenser.

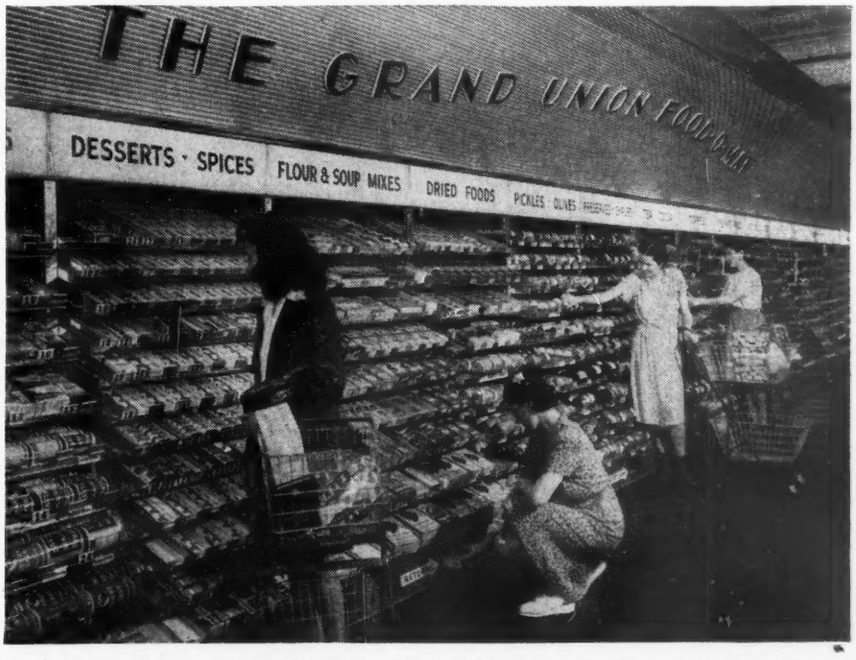
Advantages

Through this method 1,700 packaged foods and household items are serviced in approximately one-quarter the floor space required in most self-service markets. A grocery department normally requires 60 percent of the floor space of a store, while the Food-O-Mat consumes only 12 percent of the space to do the same volume of business. There is no chance for accumulation of old stock on store shelves. The first item stocked is the first picked out. This is an excellent set-up for perishables. Accumulation of dust on top of canned or glass-packed foods is minimized because of their position in the slots and short period of time on shelves. Only two or three packages are exposed at a time.

A larger variety of merchandise can be displayed in a smaller area. Conservation of space used for grocery items means more room for frozen foods, produce, bakery goods and delicatessen items. In this way, more merchandise can also be handled in a store. In addition to lending itself to mass display, self-servicing is simplified, both for the retailer and customer. The customer can easily spot her purchase and service herself more rapidly. Time required for shopping is about one-third that usually taken, and customers like the lack of congestion resulting from the elimination of extra stock in aisles. They prefer the 75 ft. straight-line display over winding in and out of the many aisles.

By continuously keeping the dispenser stocked, merchandise is always on display. Lost sales, both for the retailer and processor, do not occur because items are in the store but not available for the customer.

The Food-O-Mat provides clerks with more clean-up time. There is



The Food-O-Mat permits stock rotation and display of a larger variety of merchandise in a smaller area. The customer can quickly select her purchase and serve herself.

no cluttering of valuable aisle space due to filled, partially filled or empty cartons. About 12 ft. of uncluttered aisle space are available. It is no longer necessary for clerks to stock shelves after store closing hours. Only three persons are engaged in restocking shelves. A regular store of this size would require six to seven persons to do the job.

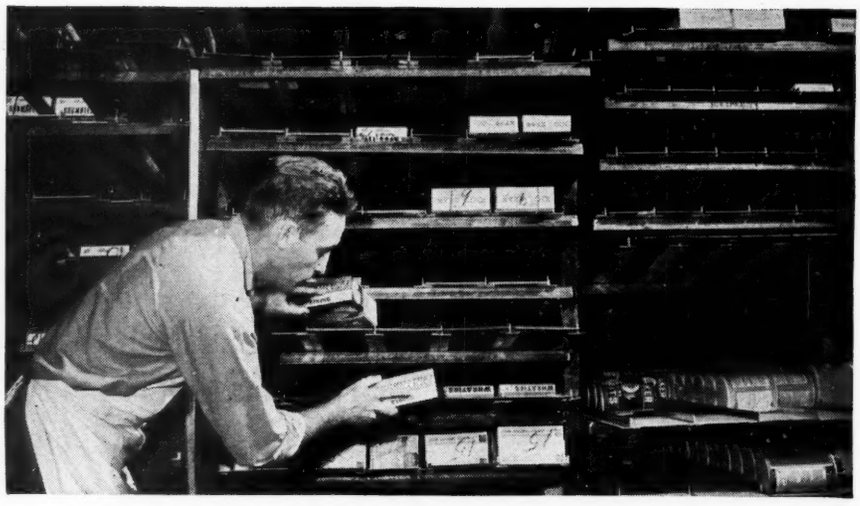
What It Means To Processors

Shelf-life of commodities varies. Some can be stored several days, others weeks and still others several months. Any system in self-service markets that facilitates stock rotation is of value to processors, retailers and customers. Better quality merchandise is assured, since stock can be merchandised upon receipt. Stock is not allowed to accumulate and be sold after termination of its guarantee period.

Installation and subsequent growth of the self-service method of merchandising has done much to make food processors product and package conscious. Rough and frequent handling of packaged foods by the customer forced them to improve their packages. Display and availability of packages to the customer resulted in bettering the design of the package. The package sold the product. The customer either liked or disliked the package, label or descriptive information on labels.

Responsibility for packaged foods does not conclude with delivery to the consignee's warehouse or the retail store. Today the food manufacturers have an able sales and sales research force constantly seeking information on the condition of their products in retail stores. Salesmen in some instances are employed to follow shipments into stores, unpack cartons, stock up shelves, rotate stock and note any changes or improvements in competitive products. Installation of automatic dispensing units of this type in super markets simplifies some of the salesmen's work. They are no longer required to stack shelves nor rotate their stock.

Food laboratories do not conclude their research with the development of new products and packages. They subject their products to accelerated storage tests or tests simulating actual conditions in retail stores before they are actually distributed. In this way food processors are in a position to determine changes likely to take place in their products in retail stores and prepare for them.



Behind the unit, store clerks periodically stock up the dispenser from a stock room. Cluttering up of aisle space due to empty or filled cartons is avoided.

Pollution of Water and Food Detected by New, Rapid Test

New test, based on isolation of enterococci, gives positive results more quickly than standard methods

A RAPID and reliable test for determining pollution in water and fresh and frozen foods was announced at the November meeting of the American Public Health Association in Cleveland by C. E. Winter and L. A. Sandholzer, bacteriologists at the College Park, Maryland laboratory of Fish and Wildlife Service, U. S. Dept of the Interior. The test is based on the isolation of enterococci found in the intestinal contents of man and animals. The presence of non-pathogenic bacteria of the human intestinal tract is taken as evidence of potentially dangerous contamination.

It is for this reason that an integral part of the bacteriological procedure for judging the quality of raw material used for food manufacture is the detection and estimation of coliform bacteria.

Present methods for determining pollution are unsatisfactory in many instances, however, because the indicator organisms (coliform bacteria) may be of soil or vegetable origin and thus have no sanitary significance. The new test for enterococci can accordingly be useful in clearly defining pollution of human or animal origin.

Rapid, positive tests for determining fecal contamination have long been sought. The new test is based on the use of sodium azide and 45 deg. C. incubation. This new enrichment medium for the isolation of enterococci gives results with 7 to 12 hours' incubation. Positive results are indicated by turbidity and acid formation.

Growth of enterococci is subsequently verified in 12 to 18 hours by sediment formation in broth and typical colonies on the slant surface of a slant-broth preparation. Selectivity of the medium is due to the presence of sodium azide, methylene blue and penicillin. Gram-stain and catalase test provide further proof.

Some 136 samples of water and soil were tested for enterococci by this method and concurrently by the standard method for coliform bacteria detection. The two tests agreed as to the presence or absence of fecal pollution in 75 percent of the cases. In 25 percent of the samples where the two tests disagreed, the majority showed the presence of *Aerobacter* types and the absence of enterococci. This may indicate that the *Aerobacter* organisms were of non-fecal origin.

How To Prevent Rancidity In Frozen Pork Sausage

Rancidity develops within three months and discoloration in one month. By omitting salt from the formula, these conditions are avoided. There are no advantages in vacuum- or gas-packing or in treatment with NDGA

By C. K. WIESMAN, Armour & Co. Laboratories, Chicago, Illinois, and
JOHN V. ZIEMBA,* Assistant Editor, "Food Industries"

FROZEN pork sausage meat or links are difficult to hold under low temperature cold storage for any extended period. After one to three months of cold storage, the following objectionable changes which detract from saleability take place: (1) Rancidification of pork fat, (2) discoloration of the lean meat.

Rancidity occurs after three months, and discoloration of lean pork meat results soon after freezing, usually within one month. Such discoloration occurs in packages that exclude light, and is not confined to the surface of the meat.

Need for Extended Shelf Life

In the meat packing industry the desire for a continuous pork sausage operation is offset by seasonal fluctuations in hog killing. Pork sausage production takes place during glutted periods. Consequently, the supply of pork sausage, either in link or bulk form, is seasonal and is plentiful only during hog slaughter. Our investigation was made to determine how to level-off production so that a constant supply could be maintained. To accomplish this, modifications in methods of treating sausage meat, methods of packaging and a combination of treatment and packaging were studied. Methods of modifying the method of processing and packaging of frozen pork sausages were investigated for the purpose of discovering a simple and practical method of preventing rancidity and discoloration during low temperature cold storage.

Some feel that salt used in the flavoring spice mixture accelerates the development of rancidity when it is mixed with pork trimmings. Others feel that it is not the salt, but the metallic impurities in the salt or spices that cause rancidity.

Stabilization of high-fat content pork sausage against rancidification by adding an antioxidant to the pork sausage was considered as one possible way of extending the shelf-life of the frozen product. To test this, the antioxidant, nordihydroguaiaretic acid (NDGA), and citric acid were included in the pork sausage formula. Citric acid was used because of its synergistic action.

Another practical approach to the solution of this problem was to eliminate oxygen from the package. Rancidity is caused by an oxidation of the pork fat. The amount of oxygen present, together with other factors, determines the rate at which rancidity takes place. Oxidation also results in a darkening of the lean meat, causing an unnatural and unattractive appearance. By packing frozen pork sausage links in tin cans under a vacuum or by replacing the air with either carbon dioxide or nitrogen gases, the amount of oxygen can be considerably reduced. It was believed that this reduction in oxygen might prevent rancidity and discoloration.

The investigation was not considered complete unless a combination approach was considered. Further attempts to stabilize frozen pork sausages were accordingly made by treatment with the anti-

After casings have been flushed free of salt, cut and tied, they are ready for stuffing. Casings are placed on the stuffer horn and stuffed as tightly as strength will permit. By stuffing tightly, product appearance is improved and casing cost reduced.

* Formerly with Armour & Co.

TABLE I—Effect of Various Methods of Packaging Treated Frozen Pork Sausages on Extent of Discoloration and Rancidity in Storage

Storage time, months	Method of treatment and packaging: NDGA treated (carton-packed)	NDGA treated (vacuum-packed)	NDGA treated (nitrogen-packed)	NDGA treated (CO_2-packed)	No salt (carton-packed)
0	Flavor and color, normal	Flavor and color, normal	Flavor and color, normal	Flavor and color, normal	Flavor and color, normal
1	Odor and flavor, good; color, slightly gray	Odor and flavor, good; color, slightly gray	Odor and flavor, good; color, slightly gray	Odor and flavor, good; color, slightly gray	Odor and flavor, normal; color, bright red
2	Odor and flavor, good; color, slightly gray	Odor and flavor, fair; color, gray	Odor and flavor, good; color, slightly gray	Odor and flavor, good; color, slightly gray	Odor and flavor, normal; color, bright red
3	Odor and flavor, slightly rancid; color, very gray	Odor and flavor, slightly rancid; color, very gray	Odor and flavor, rancid; color, very gray	Odor and flavor, slightly rancid; color, pronounced gray	Odor and flavor, normal; color, bright red
4	Odor and flavor, rancid; color, pronounced gray	Odor and flavor, slightly rancid; color, very gray	Odor and flavor, rancid; color, very gray	Odor and flavor, slightly rancid; color, pronounced gray	Odor and flavor, normal; color, bright red
5	Odor and flavor, rancid; color, pronounced gray	Odor and flavor, very rancid; color, pronounced gray	Odor and flavor, rancid; color, very gray	Odor and flavor, rancid; color, morbidly gray	Odor and flavor, normal; color, bright red
6	Color and flavor, rancid; color, pronounced gray	Odor and flavor, very rancid; color, pronounced gray		Odor and flavor, rancid; color, morbidly gray	Odor and flavor, normal; color, bright red

oxidant, NDGA, and citric acid and vacuum-packing or gas-packing in an atmosphere of nitrogen or carbon dioxide.

Treatment and Packaging

Six lots of frozen pork sausage links were put up to test prolongation of storage life by off-setting or delaying lean meat discoloration and fat rancidification. A total of 80 lb. of pork sausage links, made up from the regular formula using regular pork trimmings and flavoring spice mixture, were packed to 1-lb. net weight in the following types of packages: (1) Regular cartons for pork sausage links using a waxed paper liner, (2) vacuum-packing in enamel-lined tin cans, (3) gas-packing in enamel-lined tin cans with nitrogen, and (4) gas-packing in enamel-lined tin cans with carbon dioxide.

To a 50-lb. lot of pork sausage meat, 0.005 percent of the antioxidant, NDGA, and 0.01 percent citric acid were added. Both the antioxidant and citric acid were first mixed with the flavoring spice ingredients in a Hobart mixer and then thoroughly mixed with ground fresh pork trimmings. After linking the treated pork sausage meat, lots were packed in the conventional manner, in enamel-lined tins under vacuum and in an atmosphere of nitrogen as well as carbon dioxide.

A 30-lb. lot of pork sausage links was prepared with salt omitted from the formula. This lot was packed to a net weight of content of 1 lb. in regular pork sausage link cartons with a waxed paper liner.

All lots were quick frozen in an air blast freezer at –40 deg. F. to an internal temperature of +10 deg. F. Freezing to this temperature took less than two hours. The frozen pork sausage links were stored in a commercial cold storage warehouse with constant temperatures maintained at –5 deg. F.

Samples of frozen pork sausage links were taken at monthly intervals for chemical analysis and organoleptic tests. Peroxide values, expressed as milliliters of 0.002 N sodium thiosulfate per gram of fat, and free fatty acid content, expressed as the milligrams of potassium hydroxide required to neutralize free fatty acids in 1 gram of fat, were employed as criteria for following quality changes. Organoleptic evaluations of non-cooked and cooked samples were used primarily in determining the condition of the samples. In conducting organoleptic tests, samples were cooked by dieticians in the company's Consumer Service Kitchen. A selected taste panel included members of Sales Research, General Sales, Quality Control, Development, Standardization and Production, Consumer Service and Chemical Research Departments.

Experiments showed that frozen pork sausages made up with salt in the formula did not hold up satisfactorily in cold storage. The lean pork meat turned gray, and the

(*Turn to page* 214)

TABLE II—Effect of Various Methods of Packaging Non-treated Frozen Pork Sausages on Extent of Discoloration and Rancidity During Storage.

Storage time, months	Method of packaging: Carton-packed	Vacuum-packed	Nitrogen-packed	CO_2-packed
0	Flavor and color, normal	Flavor and color, normal	Flavor and color, normal	Flavor and color, normal
1	Odor and flavor, good; color, gray	Odor and flavor, good; color, gray – worse than control	Odor and flavor, good; color, gray – comparable to vacuum-packed	Odor and flavor, good; color, gray – comparable to vacuum-packed
2	Odor and flavor, aged but not rancid; color, gray	Odor and flavor, fair; color, gray – worse than control	Odor and flavor, good; color, markedly gray	Odor and flavor, good; color, gray – comparable to vacuum-packed
3	Odor and flavor, rancid; color, gray	Odor and flavor, fair; color, pronounced gray	Flavor and odor, rancid; color, pronounced gray	Odor and flavor, rancid; color, pronounced gray
4		Odor and flavor, rancid; color, dark gray	Flavor and odor, rancid; color, pronounced gray	Odor and flavor, rancid; color, pronounced gray
5		Odor and flavor, rancid; color, dark gray	Flavor and odor, rancid; color, pronounced gray	Odor and flavor, rancid; color, pronounced gray
6				Odor and flavor, rancid; color, pronounced gray

TABLE III—Peroxide Values and Free Fatty Acid Content of Frozen Pork Sausages Treated and Packed According to Regular and Modified Methods.

Storage time, months		Method of packing: Untreated (carton-packed)	Treated (carton-packed)	Untreated (vacuum-packed)	Untreated (nitrogen-packed)	Untreated (CO_2-packed)	No salt (carton-packed)
0	Peroxide*	2	4	2	2	2	2
	Free fatty acid**	0.35	0.33	1.10	1.10	1.10	0.35
1	Peroxide	3	1	1	2	2	1
	Free fatty acid	0.55	0.53	0.52	0.56	0.49	0.58
2	Peroxide	2	2	4	1	3	1
	Free fatty acid	0.37	0.34	0.31	0.31	0.32	0.44
3	Peroxide	3	2	3	3	5	3
	Free fatty acid	0.51	0.40	0.29	0.37	0.46	0.45
4	Peroxide	—	2	2	5	3	2
	Free fatty acid	—	0.46	0.43	0.44	0.57	0.49
5	Peroxide	—	—	1	—	—	—
	Free fatty acid	—	—	0.45	—	—	—

* Milliliters of 0.002 N sodium thiosulfate per gram of fat.
** Milligrams of potassium hydroxide to neutralize free fatty acid in 1 gram of fat.

Modern Bakery Sanitation*

To produce wholesome products, inspect and analyze raw material for any extraneous matter. Avoid contamination and infestation of ingredients in plants. Enlist employee help in keeping premises clean and insect-free

By PAUL W. HODLER, The Kroger Food Foundation, Cincinnati, Ohio

BAKERS, as well as all other food processors, have been brought face to face with the fact that by applying the proper laboratory technics, regulatory authorities can make a reasonable estimate of shop sanitation practices based solely on the examination of finished products. They know inspection activity will become more and more extensive as time goes on and realize that their own sanitation practices must be redoubled if they are to maintain high standards of sanitation and produce clean, wholesome products.

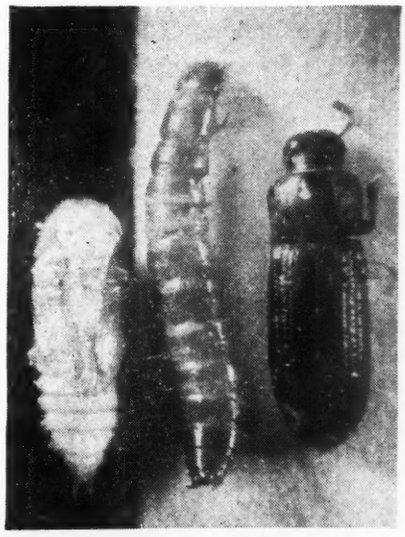
Bakers are in a unique but unenviable position. On the one hand, flour, milk and sugar offer choice food materials for rodents and insects. On the other hand, the warm humid bakery atmosphere favors development of these pests, as well as the growth of air borne molds and bacteria.

The baker is responsible—and the same is true of any food processor—for the cleanliness of his finished product. To insure this cleanliness he must analyze possible sources of contamination before he can adequately plan his control measures.

Most contamination may be attributed to one or more of the following five sources: Raw materials, insects, rodents, personnel and plant design and maintenance.

Raw Material Control

Raw materials containing insect fragments, ground up rodent pellets and rodent hair are inevitable sources of filth in the finished piece. Obviously, the baker cannot visit the mill, the dairy, sugar refinery and malt house to assure himself that all his raw materials were processed under adequate sanitary controls. He can satisfy himself as to their cleanliness by applying the same laboratory technics which may later be applied to his own products. He not only can, but he must do so, if he is to protect himself, since he is liable for insect fragments in his products, no matter whether he or the ingredient supplier is responsible for the insects. Such contamination can be detected only by proper laboratory separation technics, coupled with microscopic examination of the residues. All materials shown in the photomicrographs accompanying this article were recovered from samples of commercial shipments of flour, cornmeal or peanuts.



Pupal, larval and adult stages of confused flour beetle. (*Tribolium confusum* Duval) isolated from infested flour.

The confused flour beetle, Tribolium confusum Duval, is the most common insect found in flour. Under favorable conditions a complete life cycle may be only six weeks. Eggs hatch in 5 to 12 days in warm weather and adults live for as long as two years.

Insect fragments can be a contaminant of flour which may result from grinding insect-infested wheat or from infested mill machinery. They may also be the result of insect growth or infestation during storage or insect infestation from railroad cars during transit.

Identification of the source of hair sometimes becomes important. Rodent and human hairs are readily distinguishable under the microscope. Rodent excreta fragments, seldom found in flour, but often in cornmeal, result when improperly cleaned corn is ground.

Of course, the examples cited are not all inclusive. Any ingredient coming into a shop may carry enough filth to nullify the best laid and executed plan of shop sanitation. The baker's only protection comes first through the purchase of ingredients from responsible sources and, second, from making his own tests. When he has identified an offending ingredient, his purchasing department is in a position to remedy the situation by changing the source of supply or by insisting on the necessary sanitary corrections. Having thus satisfied himself, the baker must never relax his vigilance. Every car of flour, every shipment of any ingredient, must be carefully inspected before it is unloaded. Periodic micro-examination will make sure each product is uniformly clean.

Insect Control

After assuring a supply of clean raw materials we turn our attention to the actual shop cleanliness program, considering first, insects and their control.

The chief offenders are flour insects, such as the confused flour beetle; crawling insects, specifically roaches and silver fish; as well as such flying insects as the ordinary house fly, Mediterranean flour moth and Indian meal moth. Each requires special treatment.

Perhaps the best method of covering insect control methods is to

* Based on paper on program of Chicago Section IFT, 1946 panel session, Chicago Production Forum, sponsored by Chicago Technical Societies Council.

follow the ingredient flow through the shop. Every car of flour should be inspected prior to unloading. Samples of flour may be hand sifted over a 9 XX flour silk or a 40 mesh wire screen which will separate insect adults or larvae. If insects are found in the flour, the car should be rejected. If adult insects or larvae are found only on the outside of bags the infestation probably came during transit and can be handled by fumigation of the entire car with methyl bromide.

The flour storage room should be clean and well ventilated. Flour and other similar ingredients are best stored on skids, never directly on the floor. Piles should not be too high, with ample space around the stacks for ventilation and application of insecticides. Never stack flour against walls; resultant sweating may spoil many bags of flour. Temperature extremes are to be avoided. Ideal flour storage temperature is about 70 deg. F. with a relative humidity of 60 to 70 percent. Cold storage, below 40 deg. F. will prevent insect growth, but flour stored thus must be allowed several days to warm up before it will bake satisfactorily.

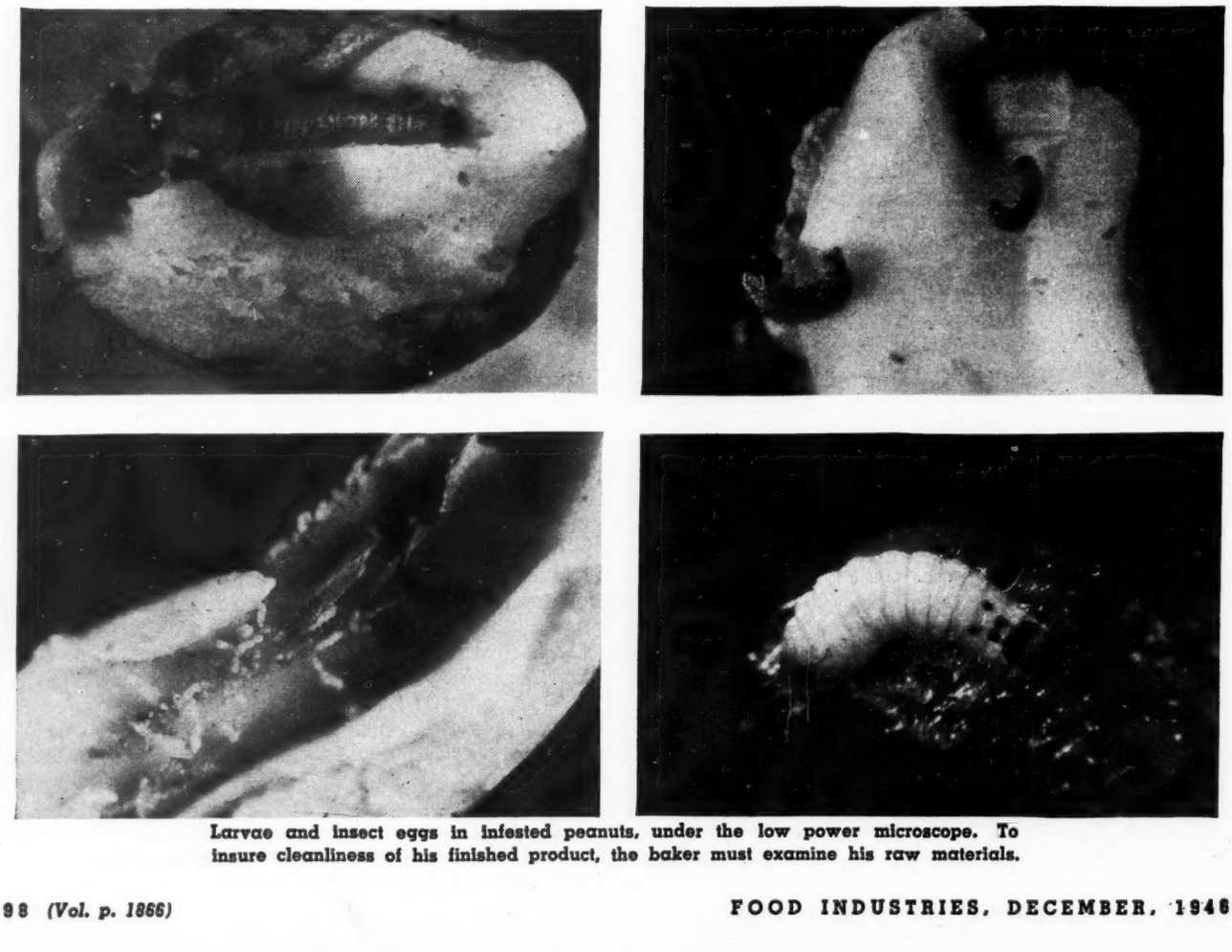
Flying insects may be controlled by a weekly spraying with a good oil base spray. The active ingredient of this spray should be pyrethrum or one of the synthetic thiocyanate compounds which were widely used during the war. Oil sprays should be sprayed in a fine mist sufficient to fog up the room, but should never be sprayed directly onto any food materials. Shortenings and fat bearing materials such as chocolate and prepared doughnut mix are especially susceptible to the possibility of absorbing odors from an oil base spray, and require protection in air tight containers during the spraying operation.

Limitations of DDT

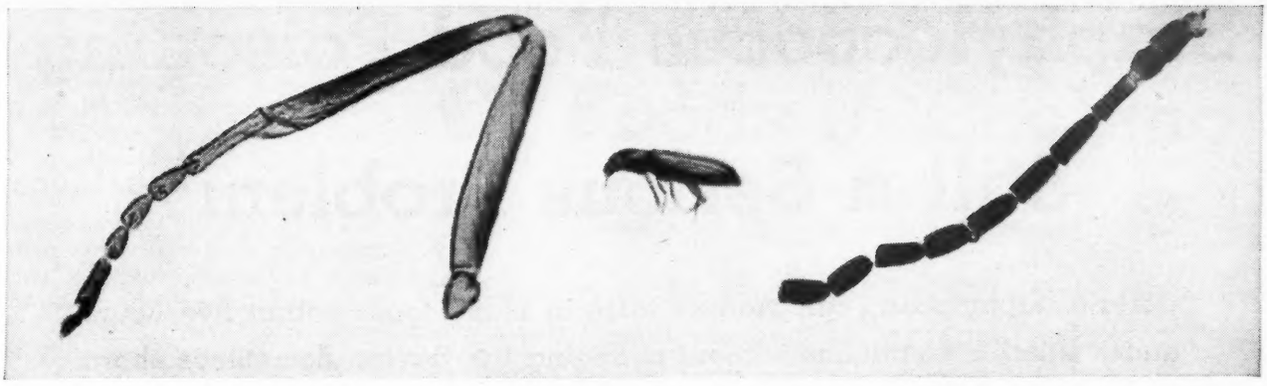
DDT is of questionable value for flying insects because of its slow killing properties as well as the residue question, the hazards of which have not as yet been adequately defined by government authorities. It can be used to advantage in spraying walls, screens and doors since a concentration of 200 mg. per square foot will give residual killing power for several months.

Roaches and silver fish may be encountered in flour storage or any where else in the plant. Control is fundamental good housekeeping, coupled with the use of a good insect powder (DDT is generally considered to be effective in this application). Roaches breed in cracks, corners, behind machinery and any place that is dark and dirty. Elimination of dirt and filth will go a long way toward cleaning up any roach infestation. A particular caution for bakers is that strong poisons such as fluoride, thallium, and phosphorus compounds must never be used around a bakery because of the serious hazard that the poison may become mixed in the finished product. DDT, borax, pyrethrum, rotenone and some of the synthetics are satisfactory for use, but the similarity between insect powder and flour still calls for extreme caution on the part of the baker.

At the flour dumping and blending operation all good housekeeping rules must be maintained. Accumulations of dust on floors, in equipment, on walls, pipelines and conduits are conducive to insect infestation. Equipment should be cleaned daily immediately following the shutdown. Remove, by brushing, noticeable dust and dirt on the outside of bags before the flour skid is hauled to the dumper platform.

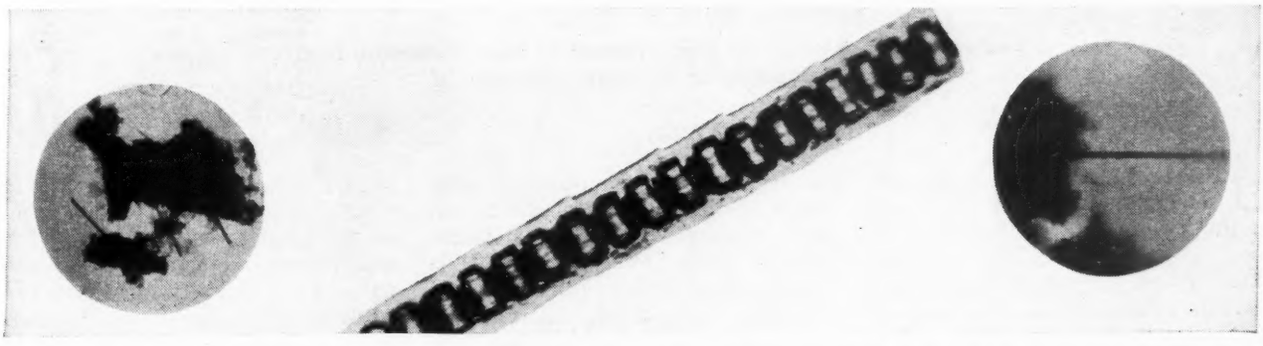


Larvae and insect eggs in infested peanuts, under the low power microscope. To insure cleanliness of his finished product, the baker must examine his raw materials.



Flour and other raw material containing insects and ground insect fragments are inevitable sources of filth in final product.

Photomicrographs (left to right) show insect leg, confused flour beetle and insect antenna (mag. 94x, 5x and 74x).



Bakers can control contamination of finished products by purchasing supplies from reliable sources and conducting their own tests. Photomicrographs show rodent hairs in rodent excreta (mak. 40x) and a section of rodent hair (mag. 460x).

Dust-proof bag cleaners are available and a necessity to clean operations. If bags are to be re-used they should promptly be tied into bundles for return to the mill or salvage department. A fumigation once each week in summer or every two weeks in winter with an ethylene dichloride-carbon tetrachloride mix or chloropicrin will control insects in the dumper and blender. These same materials should be used for fumigation of flour storage bins, elevators and conveyors.

Thorough Housekeeping

In the mixing room and dough room good housekeeping is again the watchword. Do everything possible to eliminate dust, dirt and damp or poorly drained spots in the floor. Seal all cracks or crevices around pipes and machinery. All mixing machinery and dough troughs should be thoroughly cleaned at the end of each day's operations, and scraps of dough should not be allowed to accumulate in the mixing room. Walls and all equipment should be thoroughly washed down with bactericidal solution at least once every three months. For this purpose bactericides furnished under the group designation of quaternary ammonium compounds are preferable to the hypochlorites. If mold growth is a particular problem, it may be controlled by use of fungicidal or moldicidal paints which are offered by leading paint manufacturers.

In the make-up room, the divider, rounder, and moulder require thorough cleaning each day. The bases of the machines should be sprayed with oil base spray at least once each week—more often if insects are a problem. Spraying here, as well as in all parts of the bakery, must be done when the shop is not in operation, to avoid any flavor or odor pick-up from the spray. The overhead proofer, often neglected because of its size and convenient location, is a serious source of insect contamination. Clean it thoroughly inside and outside once each week and follow with an ethylene dichloride-carbon tetrachloride mixture fumigation.

Bactericidal Washes

In the steam box the chief hazard is mold and bacterial growths which may be controlled by bactericidal washes as needed. For insects use an oil base spray when necessary, but be sure to air the box thoroughly after spraying. Ovens need no particular attention other than to apply insecticide powder around the base of the oven.

The shipping department is a particularly susceptible spot from the standpoint of infestation. This is especially true if returnable shipping boxes are used. The entire department and loading dock should be swept each day. Returned bread boxes must be cleaned outside the shipping department proper, since they often come back containing garbage and roaches. They have even been found with live mice in them. Delivery trucks should be swept out once each day. If any insect infestation is noticed, the truck may be fumigated with methylbromide or chloropicrin.

Rodent Control

Rodent control depends primarily on rodent-proofing the bakery and warehouse. It is much easier, as well as more economical, to keep rats and mice out than to trap or poison them after they are in. Foundation walls should be periodically inspected for any evidence of rat holes. All windows should be tight fitting and broken panes of glass replaced promptly. If windows must be opened, tight fitting screens are necessary. Doors are not to be left open except when in use, unless screen doors are provided.

Rats and mice already on the

(*Turn to page* 218)

Staphylococcus Food Poisoning Still a Serious Problem

Certain staphylococci can produce toxin in many foods within five hours under suitable conditions without changing the flavor. Sometimes short, violent illnesses occur if foods are not refrigerated during distribution

By G. M. DACK,
Professor of Bacteriology and Director of Food Research Institute,
University of Chicago, Chicago, Ill.

UNDOUBTEDLY the most common type of food poisoning in the United States is caused by food poisoning staphylococci. These small round or spherical bacteria grow in grape-like clusters and may produce a powerful poison. This toxin is responsible for food poisoning symptoms. Food poisoning outbreaks of this type are usually recorded in the newspaper as "ptomaine" poisoning, a name which is meaningless and should be discarded in favor of more definite and meaningful terms.

Despite the probability of its being the most frequent type of food poisoning (nearly every adult has suffered attacks of nausea and vomiting), no actually reliable statement of its prevalence may be made because: First, food poisoning which is mild or affects only one person usually is not reported; second, outbreaks may not be thoroughly investigated; and third, it sometimes happens that other causes are assigned to outbreaks which are in all likelihood due to staphylococci. Staphylococcus food poisoning outbreaks have certain features which distinguish them from all other types of disease. First of all, the majority of people who eat food containing staphylococcus food poisoning toxin usually become ill within one to five hours, averaging 2½ to 3 hours. Symptoms begin—and may end—with nausea, vomiting, abdominal cramps and diarrhea. In more severe cases, disability is great. The patient is weak, prostrated and may go into shock. Blood may be passed either in the vomitus or stools. The disease is rarely fatal and symptoms usually begin to disappear in a few hours, most victims having completely recovered in a few days. There is usually no fever or other sign of infection with living bacteria. A few people who have consumed toxic food may be resistant to the toxin and hence avoid illness.

These symptoms differ from food poisoning caused by living organisms in (a) the shortness of the incubation period from the time of eating until onset of symptoms (usually 5 to 72 hours in the latter case) and (b) in the acute, severe and rapidly terminated illness.

Origin

Food processors and handlers should be particularly concerned with the prevention of staphylococcus food poisoning and should employ safe practices during handling, storing and dispensing food. In order to safeguard the food adequately, it is important to realize that staphylococci are found everywhere in the environment, in air, in soil, on the skin and in the nose and throat. It is, in fact, impossible to prevent food from becoming contaminated with staphylococci during preparation and serving. It is, however, possible to retard or prevent growth and multiplication of the organisms with the associated formation of toxin.

Several conditions must be satisfactory for staphylococcus food poisoning to occur: (1) Food must be contaminated with a strain of toxin-forming staphylococcus, since many strains do not produce the toxin; (2) food must contain the proper nutritive requirements including such favorable conditions as the proper amount of moisture and degree of acidity or alkalinity; (3) suitable temperature for growth of staphylococci in food; and (4) sufficient time interval for growth and toxin formation.

There is no simple method for determining whether or not a specific strain of staphylococcus produces the poison. By growing the strains under special laboratory conditions, a highly potent poison may be produced which will cause vomiting in cats or monkeys. However, a serving of food with sufficient poison to cause severe symptoms in man is without effect when fed to these animals. Most laboratory animals, such as mice, rats, guinea pigs and rabbits are not affected by the poison, and for that reason the discovery of staphylococcus food poisoning was delayed for many years. Staphylococcus food poisoning was discovered only when human volunteers were fed test cultures or bacteria-free filtrates from cultures.

Foods Affected

The list of foods which provide good conditions for the growth and production of poison by staphylococci is large. Milk and milk products, custard-filled bakery goods, gravies and a variety of meats including certain cured meats are included in this list. Staphylococci grow under conditions which would tend to kill such bacteria as typhoid bacilli. For example, staphylococci grow abundantly in concentrations of salt and sugar which kill or pre-

vent the growth of typhoid bacilli. Thus, although curing solutions used in meats prevent the growth of many spoilage microorganisms, they are without appreciable effect on staphylococci.

Temperature Important

Staphylococci do not grow at storage temperatures maintained in mechanical refrigerators. At room temperature (68 deg. F.) they grow slowly, and at body temperature they grow very rapidly. In summer, however, temperatures are ideal for rapid multiplication. In the cold months of the year, heated kitchens and buildings often provide temperatures suitable for growth and toxin formation.

Obviously, it follows that at temperatures where growth of staphylococci is slow, more time is needed for the development of toxin. One worker observed that sufficient toxin was produced in food in five hours on a hot summer day to cause illness when fed to human volunteers. Food poisoning outbreaks are well known at picnics or other gatherings where perishable foods are held for a number of hours at warm temperatures. In one recent outbreak, a number of military men were made ill from eating ham containing food poisoning staphylococci. The average incubation period in this group, from the time of eating to the onset of symptoms, was four hours. The cook, unaware of the illnesses, kept the left-over ham out of refrigeration during the night. The following morning the ham was ground, mixed with scrambled eggs and served for breakfast. After breakfast a much larger group were ill and the incubation period, instead of being four hours, averaged approximately one hour. This striking illustration shows the increase in toxin production after a longer period of time at a favorable temperature.

Refrigeration Only Safeguard

Staphylococci alone, without their growth products, cause no ill effects when fed to man. The poison is formed only after the growth of food poisoning staphylococci in a favorable medium. There is an urgent need to know more about the poison and to develop simple methods for its detection in suspected food. At the present time there is no simple test to demonstrate the presence of toxin other than by feeding human volunteers or by

(*Turn to page* 224)

Specific Heats Of Foods in Cooking

By WILLIAM O. ORDINANZ,
Mechanical Engineer, Brasov, Roumania

THE majority of these data on specific heats of foods are from researches at the Institute for Mass Feeding at Kiew. Precooked frozen food processors may need the figures

Average Specific Heat of Food Stuffs between 32 and 212 Deg. F.
(Specific heat of water = 1.00)

	Water content, percent	Specific heat, B.t.u. per lb. per deg. F.
Soups		
Broth	.....	0.74
Cabbage soup	.....	0.90
Pea soup	.....	0.98
Potato soup	88	0.94
Fish		
Fried	60	0.72
Fresh	80	0.86
Dried, salt	16–20	0.41–0.44
Fats		
Butter	14–15.5	0.49–0.51
Margarine	9–15	0.42–0.50
Vegetable oils	.....	0.35–0.45
Beverages		
Cacao	.....	0.44
Cream, 45–60%, fat	57–73	0.73–0.78
Rich (cow) milk	87.5	0.92
Skim (cow) milk	91	0.95–0.96
Vegetables		
Artichokes	90	0.93
Carrots, fresh	86–90	0.91–0.94
Carrots, boiled	92	0.90
Cucumber	97	0.98
Leek	92	0.95
Lentils	12	0.44
Mushrooms, fresh	90	0.94
Mushrooms, dried	30	0.56
Onions	80–90	0.86–0.93
Parsley	65–95	0.76–0.97
Peas, air dried	14	0.44
Potatoes	75	0.84
Potatoes, boiled	80	0.87
Sorrel	92	0.96
Spinach	85–90	0.90–0.94
White cabbage, fresh	90–92	0.93
White cabbage, boiled	97	0.98
Fruit		
Apples	75–85	0.89–0.96
Berries, fresh	84–90	0.89–0.98
Berries, dried	30	0.51
Fruits, fresh	75–92	0.80–0.90
Fruits, dried	30	0.50
Plums, fresh	75–78	0.84
Plums, dried	28–35	0.53–0.59
Meat		
Bacon	50	0.48
Beef, fat	51	0.69
Beef, lean	72	0.82
Beef, mincemeat	.....	0.84
Beef, boiled	57	0.73
Bones	.....	0.40–0.60
Goose (eviscerated)	52	0.70
Kidneys	.....	0.86
Mutton	90	0.93
Pork, fat	39	0.62
Pork, lean	57	0.73
Sausages, fresh	72	0.82
Veal	63	0.77
Veal cutlet	72	0.82
Veal cutlet, fried	58	0.74
Venison	70	0.81
Miscellaneous		
Bread, white	44–45	0.65–0.68
Bread, brown	48.5	0.68
Curd (cottage cheese)	60–70	0.78
Dough	.....	0.45–0.52
Flour	12–13.5	0.43–0.45
Grains	15–20	0.45–0.48
Salt	.....	0.27–0.32
Macaroni	12.5–13.5	0.44–0.45
Pearl barley	.....	0.67–0.68
Porridge (buckwheat)	.....	0.77–0.90
Raisins	24.5	0.47
Rice	10.5–13.5	0.42–0.44
Sugar	.....	0.30
White of egg	87	0.92
Yolk of egg	48	0.67

Palletized Handling Cost Cut With Nationwide Exchange

By operating the first pallet exchange, the Lawrence Warehouse Company brings economies of unit load handling to shippers and receivers. Staff engineers will help lessees with special materials handling problems

By D. I. PURSLEY, Materials Handling Engineer
Lawrence Warehouse Co., San Francisco, Calif.

THE first pallet exchange pool, organized by the Lawrence Warehouse Company, promises to revolutionize and reduce the cost of palletized handling. Circulation of pallets will solve the problem of the shipper's investment in pallets by making them available at substantial savings. These economies are made possible by a national pool which furnishes standard pallets on a lease basis and keeps them circulating like box cars.

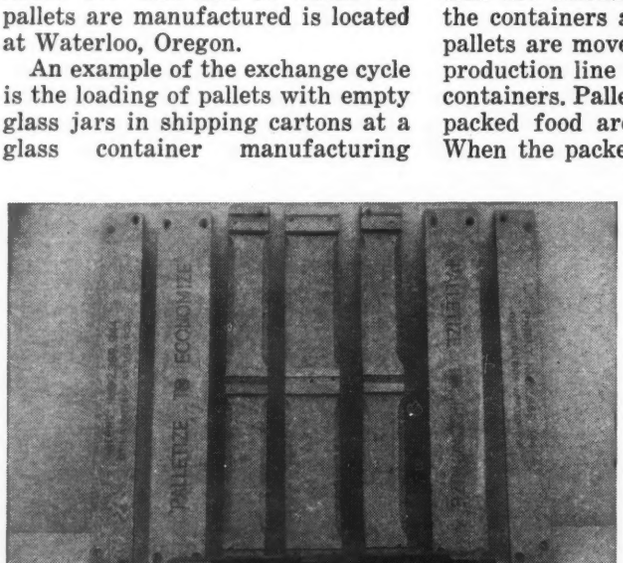
For the pallet operation, the Lawrence Holding Corp. has formed the Lawrence Universal Pallet Corp. which will operate the Lawrence Pallet Exchange and will be closely affiliated with the Lawrence Warehouse Co. The mill in which the pallets are manufactured is located at Waterloo, Oregon.

An example of the exchange cycle is the loading of pallets with empty glass jars in shipping cartons at a glass container manufacturing plant, for shipment in box cars to a food packing plant. Cars are unloaded with fork lift trucks and cartons are stored on the pallets. As the containers are used, the empty pallets are moved to the end of the production line to receive the filled containers. Pallets loaded with glass packed food are then warehoused. When the packer ships to a wholesale company by palletized carloads, the wholesale company unloads the cars with fork lift trucks and eventually removes the material from pallets. A surplus of empty pallets accumulates in his warehouse. At this point, Lawrence directs the wholesale company to ship a carload of empty pallets to the glass container manufacturer. The cycle then starts up again.

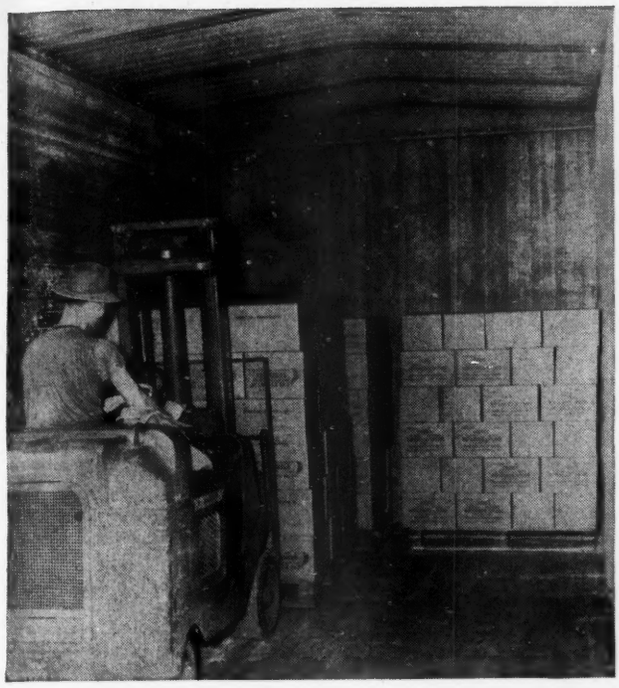
D. I. Pursley, the author, a Lieut. Commander in the Naval Supply Corps during the war, was officer in charge of the Materials Handling Division at the Supply Depot, Oakland, Calif. He was largely responsible for the Navy's much talked of unit load program. After the war he conducted research on the potential of pallet handling in commerce and industry. This work led to the development of the Lawrence Universal Pallet and the Lawrence Pallet Exchange. He is now vice-president of the Lawrence Universal Pallet Corp.—The Editors.

Cost

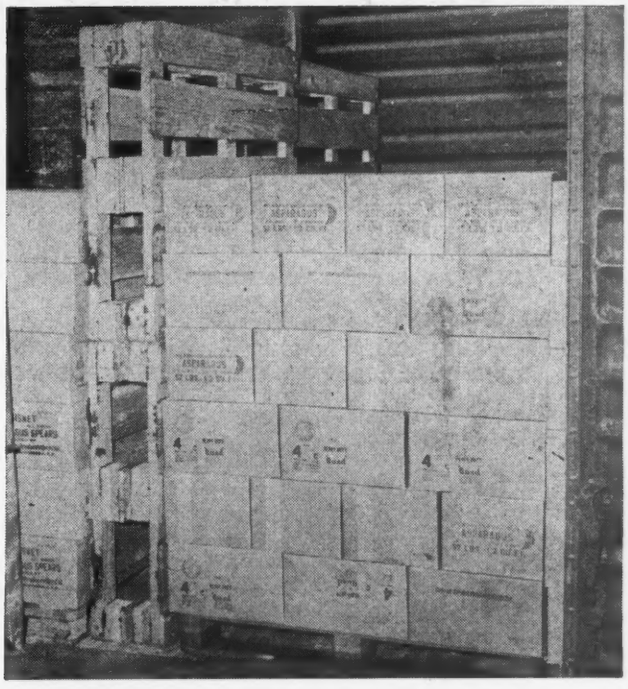
Lessees report weekly the number of pallets shipped and received so that Lawrence may move empty pallets to shortage points from the nearest surplus point in full carload lots, freight collect. Charge for this service is $0.05 for every pallet shipped loaded. There is no charge for empty pallets returning except freight from the nearest surplus point. During the four year term of the lease, lessees pay a $3.00 deposit and rental of $0.25 a year.



(Left): Knocked down Lawrence Universal Pallet. Standardized pieces, when damaged, can easily be replaced with spare parts. (Below): Complete pallet weighs about 50 lb. Rounded corners minimize splitting of the stringer and the top and middle boards.



Placing the pallets in a box car. The Lawrence loading system requires pallet loads one high to reach minimum carload weights.



Car fully loaded with cases of canned asparagus on Lawrence Universal Pallets. Empty pallets are used as dunnage in the car.

An 8-way 40 in. x 48 in. pallet was adopted after studying all types of transportation equipment. Trends were also considered in design of new rail cars and trucks, existing pallet handling equipment and sizes of shipping containers used in volume. Factors considered in designing the pallet also included size, weight, durability, repairability, rigidity, nesting, ventilation for material under refrigeration and adaptability to lift from four sides by fork and hand lift trucks.

The pallet weighs 55 lb., and is made of replaceable parts. It will hold static loads of 30,000 lb. in general warehousing and dynamic loads of 10,000 lb. under conditions experienced in rail shipments.

Comparative Costs

For a comparison of costs, consider loading 1320 cases of 24—2½ cans of asparagus weighing 52 lb. per case into a box car for shipment from San Jose, Calif. to Los Angeles. Assume that the fork truck-pallet system is used for a stock of palletized asparagus 100 ft. from the car.

Under the present system, most canneries use a loading team consisting of a checker, four laborers, a fork truck and a fork truck operator. The fork truck operator delivers the pallet load to the car and laborers unload the pallet and stack the material on the floor.

Under the Lawrence method, cases are unitized on to the pallets with glue or other means at the end of the production line. A unit contains 60 cases of 24—2½ cans of asparagus. A standard 40 ft. 6 in. box car will hold 22 units. With the Lawrence method, laborers are eliminated.

In calculating costs to load by the two methods, maintenance and amortization or rental costs of either type of pallets may be disregarded and the cost will be assumed to be approximately the same. With the Lawrence method, a competent fork truck operator will eliminate the checker, since it is only necessary to check 22 units instead of 1320 cases.

As shown in the tables, there is a saving of $8.00 per car when loading by the Lawrence pallet exchange method, in comparison with conventional loading. The saving in unloading cars is even greater than in loading, amounting to $15.00 per car under existing freight rates. When railroads make a dunnage allowance for pallets, this saving will exceed $18.00 per car.

Advantages

Aside from the fact that the canner or producer will reduce his cost in handling inbound and outgoing materials, other savings are:

1. Easier and more accurate checking of receipts, deliveries and inventory, since all standard items will be received in standard units.
2. Lower trucking and commercial warehouse charges.

(*Turn to page* 224)

TABLE I—Cost of Loading and Unloading a Carload by Lawrence Pallet Exchange Plan (1320 cases of 24—2½ cans of asparagus)

	Loading		Unloading	
	Rate	Cost	Rate	Cost
1 Fork truck operator	1 hr. @ $2.00	$2.00	¾ hr. @ $2.00	$1.50
1 Fork truck	1 hr. @ $1.00	$1.00	¾ hr. @ $1.00	$0.75
Gluing 22 units	.....	$2.00	.....	.....
*Replacement costs on 26 pallets	@ $0.15	$3.90	.....	.....
Service charge on 26 pallets	@ $0.05	$1.30	.....	.....
Freight on 26 pallets from San Jose to Los Angeles	.....	.....	.....	$3.36
Total		$10.20		$5.61

* Four additional pallets used to brace load.

TABLE II—Cost of Loading and Unloading a Carload by Conventional Method (1320 cases of 24—2½ cans of asparagus)

	Loading		Unloading	
	Rate	Cost	Rate	Cost
1 Checker	1¾ hrs. @ $1.50	$2.62	2 hrs. @ $1.50	$3.00
1 Fork truck operator	1¾ hrs. @ $1.75	$3.06	2 hrs. @ $1.75	$3.50
1 Fork truck	1¾ hrs. @ $1.00	$1.75	2 hrs. @ $1.00	$2.00
4 Laborers	1¾ hrs. @ $1.55	$10.84	2 hrs. @ $1.55	$12.40
Total		$18.27		$20.90

Recent Developments In Continuous Butter Making

Two new butter-making processes, that handle sour cream as satisfactorily as sweet cream, have been announced. Both use variations of continuous ice cream freezers as churns that extrude the butter for immediate packaging

By Arthur V. Gemmill, Assistant Editor, "Food Industries"

SINCE the information was released that the Germans were making butter by continuous processes during the entire war period, a number of additional processes for continuous butter making have come to light.

In this country, two processes, apparently in operation experimentally for a number of years, have recently been announced. They are the Cherry-Burrell and the Creamery Package Continuous Buttermaking Processes. In their development, account was taken of the fact that, in contrast to the European practice of churning sweet cream, a large part of the butter produced in this country is made from sour cream that must be neutralized and pasteurized. In each process a fat concentrate, from which practically all of the skim milk has been removed, is mixed with salt water in the proper proportion to produce a butter containing the desired amount of fat and salt. This mixture is pumped through a machine, similar to a continuous ice cream freezer, where it is quickly cooled, and at the same time worked, and extruded in the form of butter.

Cherry-Burrell Process

The Cherry-Burrell process, which was developed over a five or six year period in conjunction with a large Illinois butter producer, involves four principal operations:

1. The separation or concentration of the cream as it is received by the creamery, to between 86 and 90 percent butterfat.
2. Pasteurization of the separated cream.
3. Standardizing in batches to the desired composition.
4. Chilling and working continuously into butter.

Cream is received in the usual manner and pumped to supply vats equipped with agitators and facilities for heating. For continuous operation at least two supply tanks are required—one being filled while the other is emptied.

From the supply tanks the cream is pumped through a machine called an agitating heater, to the separator. This heater is equipped with an agitator that facilitates quick heating and brings the cream to a partially destabilized, or whipped, condition. This is said to be an aid to efficient separation and positive concentration.

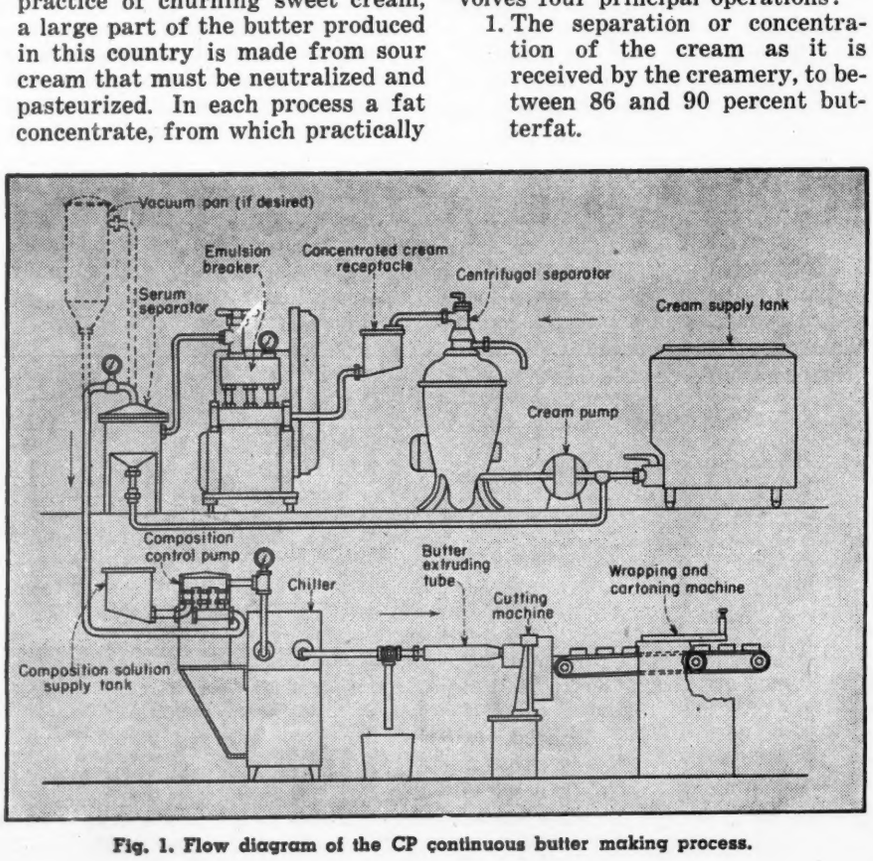


Fig. 1. Flow diagram of the CP continuous butter making process.

Special Separator Used

Normally, cream separators are built to handle sweet milk or cream, but quickly become clogged with the curd that separates from the skim milk when separating cream of slightly higher than normal acidity. To overcome this difficulty a specially designed De Laval separator is used. Of particular interest in this machine are the special discharge nozzles that permit the sludge, that usually packs around the outside of the bowl, to discharge continuously.

This machine is capable of handling fresh or sour cream, neutralized or otherwise, and of low or high fat content. It will discharge a cream testing 86 percent fat or higher as required for this process.

Vacreated

After leaving the separator the cream is pumped to a Vacreator where it is continuously pasteurized

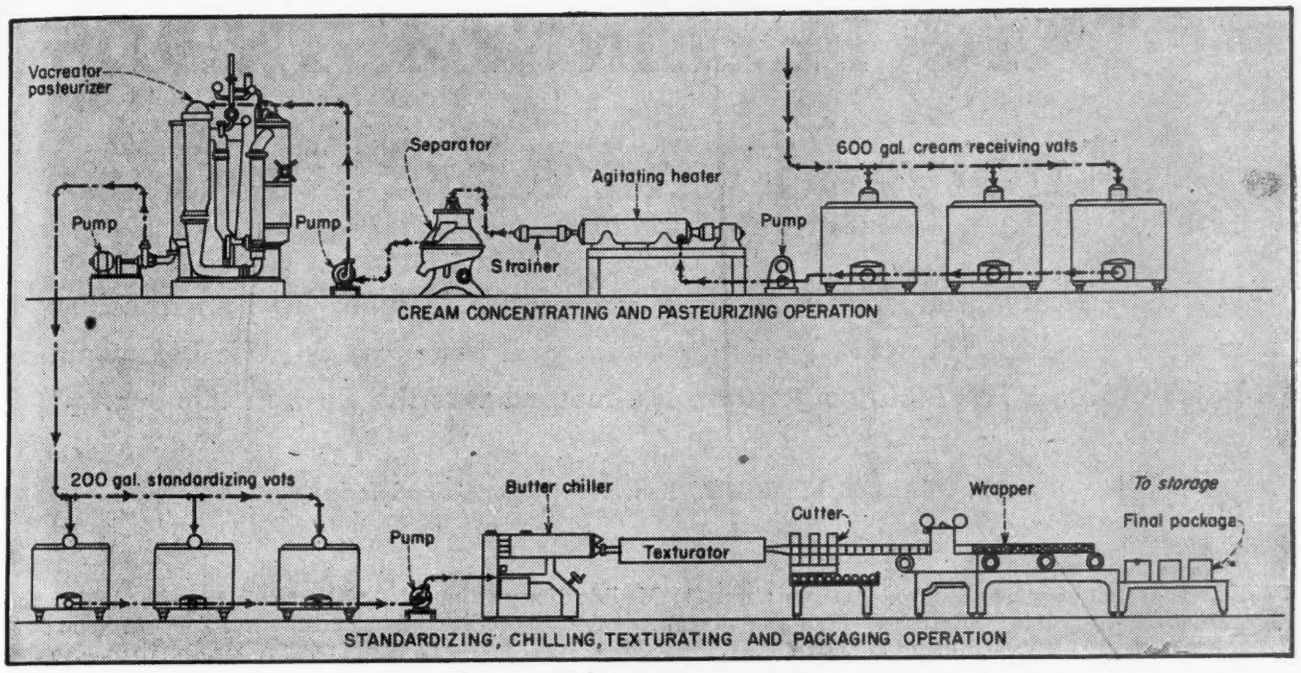


Fig. 2. Flow diagram of Cherry-Burrell continuous butter making process.

by exposure to a temperature of from 190 to 200 deg. F. for a few seconds. This high temperature flash pasteurization results in greater bacterial destruction and enzyme inactivation than the lower temperatures generally used for batch pasteurization. In the Vacreator, air and oxygen are removed from the cream, together with feed, weed and other volatile off-flavors and odors that affect the keeping quality and flavor of the finished butter. In the Vacreator, the cream is cooled by vacuum from the pasteurizing temperature and discharged at a temperature of 110 to 115 deg. F.

Standardization

From the Vacreator the fat concentrate is pumped into standardizing vats, which are equipped with specially designed agitators that mix the materials used in standardizing, and maintain uniform mixtures while the vats are being emptied.

When sufficient of the fat concentrate has been run into a standardizing vat a sample is taken and tested for acidity and for butterfat. The required amount of salt and water are weighed out and mixed together. The neutralizer, when required, is dissolved in this salt water and all are added to the fat concentrate in the standardizing vat. Butter color, starter distillate or butter culture, are added if desired, and the mixture thoroughly agitated.

Chiller and Texturator

The butter mix is then pumped through a chiller—a machine similar to a continuous ice cream freezer—where the butter fat is crystallized and the mixture converted into butter.

The butter coming from the chiller, however, has a hard, brittle crumbly body. Additional working, without refrigeration, is required and this is accomplished by a device called the texturator. The partially worked butter enters the texturator directly from the chiller and is extruded from it at a temperature of about 48 deg. F. ready for printing, wrapping, and cartoning.

The resulting butter is said to have a very compact body, a closely knit grain, and tough waxy texture.

Creamery Package Process

In the CP process, the cream, either sweet or sour, is received, neutralized, pasteurized and held in readiness for butter making operations in the usual way. The cream is heated in a supply tank to about 170 deg. F. which liquefies the fat and destroys enzymes which cause rancidity in the finished butter.

The hot cream is pumped from the tank to a separator which is adjusted to deliver cream having a fat content between 75 and 80 percent.

This hot concentrated cream flows into a surge drum that feeds it continuously into an emulsion breaker. (an adaptation of an homogenizer of the pressure valve type). The heated cream enters the emulsion breaker in a state in which the fat is dispersed in skim milk—each fat globule being surrounded by a tenacious film of serum. In the emulsion breaker these forces are overcome by subjecting the cream to counter forces which disrupt the protective films and cause the fat globules to coalesce and form a serum-in-fat phase. The resultant product is a freely separable mixture of liquid fat and serum that will satisfy immediately when quiescent.

Fat Concentration

The broken cream is discharged from the emulsion breaker into a serum separator. Immediately upon entering this chamber the fat and serum separate by stratification, the lighter fat rising to the top and the heavier serum fraction gravitating to the bottom. The top portion is said to contain about 98 percent fat. The serum is discharged back to the cream supply line ahead of the separator for the recovery of any fat entrapped therein.

Composition Control

The highly concentrated hot liquid fat accumulated at the top of the serum separator flows to a composition control pump. This is a triplex piston pump in which two cylinders receive the fat fraction from the serum separator, and the third cylinder receives composition solution from a supply tank. All

(*Turn to page* 226)

POTATO PEELING METHODS Analyzed and Appraised

Part II—Factory production runs show poorest yields with the brine peeling method, good results with abrasive peeling, and better yields with the steam batch process. The high temperature lye method was the best, in this survey*

By L. CHARLES MAZZOLA, Associate Editor, "Food Industries"

THERE are eight generally used methods of peeling potatoes: (a) Abrasive, batch[1] (Sterling, Reco, Hobart, etc.); (b) Abrasive, continuous, (Urschel); (c) Flame, (Savage); (d) Dilute lye, 3 to 6 percent, for new potatoes; (e) High-temperature lye for all potatoes, (Mazzola[2]); (f) Salt brine, (Western Regional Laboratory[3]); (g) Batch steam; (h) Continuous steam[4]; and (i) Modification of the high-temperature lye peeling (Lankler[5]).

Questionnaires were sent to users or sponsors of each of the above methods. Data sought included quantitative information on the performance of these methods in actual practice. In the case of the flame peeling, no response was received from Savage, nor could anyone be found that was then employing the flame peeling method, hence no data are given for this method. No figures were made available on the continuous steam peeler, neither was it possible to see one in operation, although one was seen installed. The dilute lye peeling for small new potatoes, if used, is used to a limited extent and only for a short time after harvest. Figures on this method could not be secured.

Eliminating the methods on which data could not be obtained, this report covers four processes, three of which are extensively used: (1) Continuous abrasive, (2) high-temperature lye, (3) batch steam and (4) brine peeling. The only processor who employed brine peeling actually used a continuous abrasive peeler after the potatoes had been put through a tank containing a boiling "brine" solution. On the day of a visit to this plant, the so-called "brine" tank was boiling at an indicated temperature of 212 deg. F.

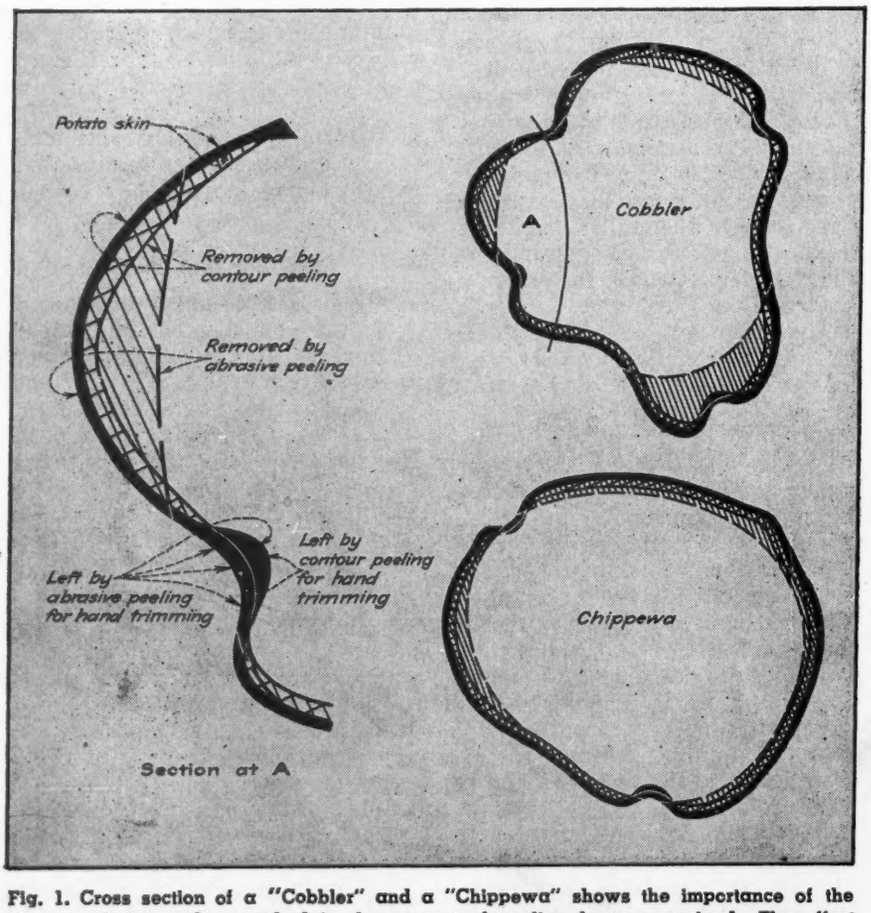


Fig. 1. Cross section of a "Cobbler" and a "Chippewa" shows the importance of the shape and the peeling method in the amount of peeling losses sustained. The effect of variety and peeling method can be followed by studying the enlarged Section "A".

Conversion Formula

The figures reported by the cooperating processors were based on potatoes varying in condition and in grade. Some used 100 percent U. S. No. 1 stock, others used stock that graded 40 percent U. S. No. 1. To make these figures comparable it was necessary to devise a formula to convert the results with 40 percent U. S. No. 1 stock to 100 percent U. S. No. 1 stock basis and those reported when 100 percent U. S. No. 1 stock was used to 40 percent U. S. No. 1 stock basis. The object of this double conversion is to cancel

* Part I of this article, in FOOD INDUSTRIES, November, 1946, described potato varieties, storage factors and conditioning of stock.

out any error in the results due to the formula employed.

When 40 percent U. S. No. 1 stock was used, the results were converted to 100 percent U. S. No. 1 stock basis by multiplying the weight of waste reported (W) by 0.60, which is the proportion of the stock below U. S. No. 1 grade. The result (W_1) is the calculated weight of the waste had 100 percent U. S. No. 1 stock been used. By deducting this (W_1) from the weight of the raw stock (R) reported as used, the calculated weight of the raw peeled stock (RE_1) resulted. Similarly when 100 percent U. S. No. 1 stock was used, it was converted to 40 percent U. S. No. 1 stock basis, by dividing the weight (W) of the waste reported by 0.60, which is the proportion below grade in the case of 40 percent stock. The result (W_2) is the calculated weight of waste had 40 percent U. S. No. 1 stock been used. By deducting this (W_2) from the reported weight of the raw stock used (R), the calculated weight of raw peeled stock (RE_2) resulted.

Where the weight of the waste was not given, the dehydrated weight reported (D) was multiplied by 6 to secure the weight of the reconstituted raw peeled potatoes (RE).

The formulas mathematically stated are:

To convert dehydrated weight for finding waste:

$D \times 6 = RE$ and $R - RE = W$

To convert from 40 percent to 100 percent U. S. No. 1 basis:

$W \times 0.60 = W_1$ and $R - W_1 = RE_1$

To convert from 100 percent to 40 percent U. S. No. 1 basis:

$W \div 0.60 = W_2$ and $R - W_2 = RE_2$

Abrasive Peelers

There are two types of mechanical abrasive peelers. One is the batch type and the other is the continuous type. For large-scale operation many employ the continuous abrasive peeler.

The capacity of the continuous abrasive peeler is two tons per hour. It is equipped with a 5 hp. motor. The unit has 144 abrasive rollers. The capacity and the yield are dependent upon the condition of the potato stock, the variety used and the degree of peel removal desired to reduce the subsequent trimming operations to a minimum. Fig. 1 shows graphically the relative losses in two typical varieties having different contours. Because of the irregular shapes of most potatoes, this particular method of peeling results either in grinding stock away, or in leaving excessive unpeeled

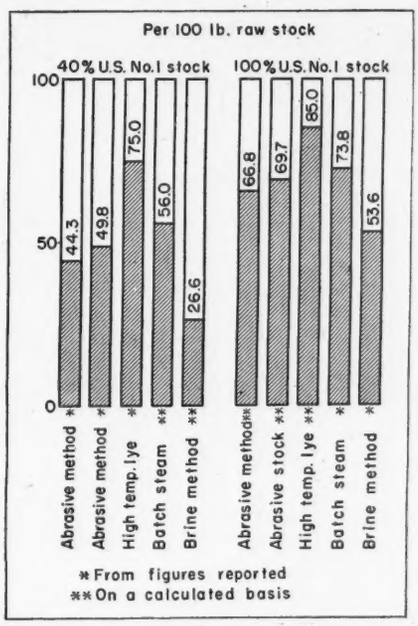


Fig. 2. Peeling efficiencies produced with various grades of raw potato stock by the more important methods of peeling.

areas to be removed by hand trimming. Inherently the method cannot do otherwise. It is the grinding of an irregular surface toward a regular shape. Thus it is seen that varieties with more regular contours lend themselves to greater yield or efficiency.

Not losing sight of the fact that there can be a great variation in the efficiency obtained with this method, the following data (shown also in Fig. 2) are nevertheless valuable since a sizable operation is covered. In one plant in a 3-month period 4,000,000 lb. of raw potatoes were processed. This produced 297,200 lb. of dehydrated potatoes. The operator of this plant estimated that the raw stock put through was 40 percent U. S. No. 1. On the basis that each pound of dehydrated potato (D) will produce 6 lb. of reconstituted potatoes (RE), a total waste (W) of 2,216,800 lb. is incurred due to peeling, trimming, storage, blanching and mechanical losses. This loss (L) is equal to 55.7 percent of the original 4,000,000 pounds of raw stock (R). Thus the overall efficiency (E) in this particular operation was 44.3 percent. There are no records to show how much of this is strictly due to the peeling and trimming operations. While the figures do not disclose these details they do show the trend.

By using the above formula to convert these figures to a 100 percent U. S. No. 1 stock basis loss is reduced from 55.7 to 33.2 percent.

The next operation reported, covered an 8-month period during which 81,495,000 lb. of raw potatoes were put through the abrasive peeler. The stock was about 40 percent U. S. No. 1, and was in good condition. It was better than the stock covered in the previous period. In this period, 6,750,000 lb. of dehydrated potatoes were produced.

High-Temperature Lye

This method was first described in the January, 1943 issue of FOOD INDUSTRIES by Mazzola[2] and in subsequent issues by Burton[6] and Dunlap[7]. Briefly stated the method permits precise control of depth of penetration and peel removal. The method is sufficiently effective to give instant response to different conditions of stock, which varies widely with variety, locality grown and, most importantly, time and condition of storage. The method produces a uniform product from such greatly varying raw stock because it is flexible and can be accurately controlled.

Regardless of the condition of the stock—ranging from freshly dug clean tender potatoes to shriveled up old rubbery storage potatoes—the lye method can peel it by an immersion of from 5 to 60 seconds. By proper control of temperature, and time of contact, the depth of penetration can be controlled to suit all conditions. The efficiency of the method is due to its nature. It is not mechanical—it is physical and chemical. The digestive action of the medium follows the contour of the potatoes. This is particularly true when the motion is imparted to the potatoes through the medium. The action occurs simultaneously over the entire surface regardless of shape or condition of stock, removing an even layer, the thickness of which is controlled to suit particular requirements. As can be seen from Fig. 1, a minimum amount of hand trimming is required when lye peeling is used.

In a period covering almost a full year's operation, a total of 115,710,000 lb. 40 percent U. S. No. 1 raw potatoes were processed with a total yield of 14,500,000 lb., 93.2 percent dry, dehydrated potatoes. This equals a loss of 25 percent, which includes not only peeling and trimming losses, but storage and other handling losses. By using the same formula as before, a calculated loss of 15 percent was arrived at on a 100 percent U. S. No. 1 stock basis. This equals an efficiency of 85 percent.

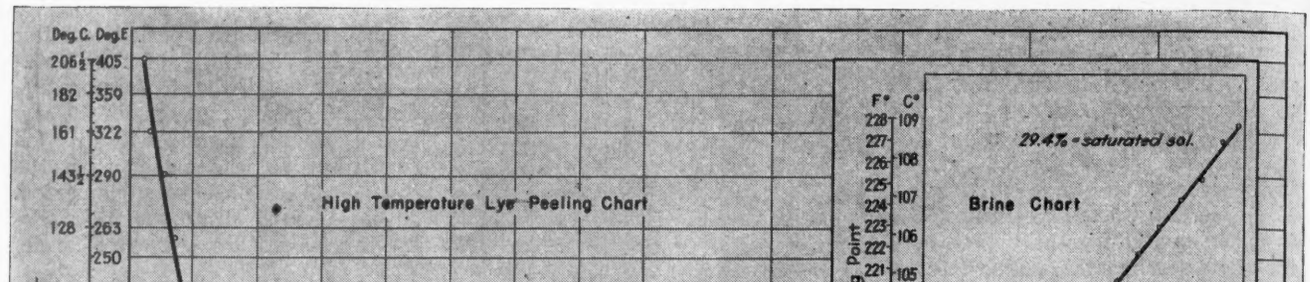


Fig. 3. High temperature lye chart showing time of immersion needed at different temperatures to effect proper penetration for minimum waste. Inset: Boiling point of brine solutions of different concentrations for use in brine peeling method.

Batch Steam Peeling

The potatoes are always washed and preheated for 3 minutes at 170 deg. F. before entering the steam peeler. This preheating is to condition the stock "to prevent subsequent darkening" of the peeled potatoes.

Each batch steamer has a capacity of about 200 lb. of potatoes per charge. Potatoes are put in the unit which rotates slowly and is kept under 80 lb. steam pressure for 1½ to 2 minutes. At the end of the cycle, governed by an electrical control board, the steam is exhausted from the steamer into a 4-in. cold water line.

Each steamer requires one attendant to operate it. By having a sufficient number of these batch units and properly staggering their operations, subsequent trimming can be set so as to give a continuous effect. The steamed potatoes are dropped from the steamer into rough rubber covered rolls which keep the potatoes rotating. Water sprays from the top, having a pressure of about 80 lb., boosted by suitable pumps, wash off the loosened peel from the potatoes.

In the particular operation under study 70 bags of potatoes per hour were put through, using about 1½ steam peelers, and about 2000 gal. of water per minute. This was equal to about 46 bags of potatoes per hour per steam peeler. The total cycle of time for loading, steaming, exhausting and unloading was about 4 minutes. In a period of 27 days 2,844,000 lb. of 100 percent U. S. No. 1 potatoes were peeled. This quantity of raw stock produced 328,000 lb. of 95 percent dry, dehydrated potatoes which figures to a shrinkage of 8.55 to 1. By using the same reconstituting formula as previously, an overall efficiency of 73.8 is secured, resulting in a loss of 26.2 percent. This includes not only peeling and trimming losses but also handling losses. Converting these figures to 40 percent U. S. No. 1 stock basis, using same formula as before, this 26.2 percent loss becomes a 44 percent loss.

Brine Peeling

With a saturated (29.4 percent) sodium chloride solution, the maximum temperature that can be reached is 227 deg. F. This condition presents a number of limiting factors. First, it is difficult to maintain a solution at the saturation point constantly; second, a saturated solution of sodium chloride has a great tendency to crystallize out, and third, the maximum temperature obtainable of 227 deg. F. is often insufficient to produce proper "digestive" effect in the desired time. This produces a deep penetration which defeats the objective of "contour" peeling. If the depth of the cooked penetration cannot be precisely controlled, efficient peeling results cannot be obtained.

(*Turn to page* 212)

TABLE I.—Recapitulation of Data on Efficiencies of Various Methods of Peeling

Method	Raw Potatoes Used (Thousands of Pounds)	Dehydrated Potatoes Produced (Thousands of Pounds)	Basis 40% U. S. No. 1 Stock				Basis 100% U. S. No. 1 Stock			
			Reconstituted		Waste		Reconstituted		Waste	
			(Thousands of Pounds)	%	(Thousands of Pounds)	%	(Thousands of Pounds)	%	(Thousands of Pounds)	%
Abrasive—Stock, Poor	4,000*	297*	1,783	44.3	2,216*	55.7	2,669	66.8	1,330**	33.2
Abrasive—Stock, Good	81,495*	6,750*	40,500	49.8	40,995*	50.2	56,898	69.7	24,597**	30.3
Batch Steam	2,844*	348*	1,592	56.0	1,252**	44.0	2,092	73.8	751*	26.2
High Temperature Lye	115,710*	14,500*	87,000	75.0	28,710*	25.0	98,484	85.0	17,226**	15.0
Brine	315*	28*	72	26.6	242**	73.4	169	53.6	145*	46.4

* From reported data.
** Calculated basis.

Bigger Trucks Cut Meat Delivery Costs

Switch from smaller models reduces number required to make refrigerated deliveries over a wide area. Their design also permits higher speeds at greater safety

BY using legal limit trucks capable of carrying 12½-ton loads instead of 8½ tons, the Tobin Packing Co. has cut the cost of distribution of frankfurters and other meat products, from its Rochester, N. Y., plant, by approximately 70 cents per cwt. Briefly, this was done by the use of three-axle, six-wheeled trucks having a legal gross weight of 45,000 lb. instead of two-axle, four-wheeled trucks with a gross weight limitation of 36,000 lb.

The trucks have insulated and refrigerated bodies, which maintain an inside temperature of 40 deg. F. Each truck averages about 1,000 miles a week. They cover a wide distribution area in upper New York State, extending from Rochester to Watertown and Massena in the northeastern area and to Jamestown on the southwest as shown in the accompanying map. Each truck makes two or three trips per week.

The trucks employed are Model LJSW Macks having tandem rear axle bogies, with both axles driven. The first of these went into service in July, 1945. Since then eight identical units have been ordered. The truck cab and body are made integral, as shown in the illustration, and a sleeping compartment is provided in back of the driver's seat.

The Mack six-wheelers have replaced a larger number of smaller two-axle company trucks. Deliveries are made to large retail markets and grocery stores. By company trucks, deliveries are at least from 5 to 12 hours faster than by rail express, or common motor carrier lines.

The inside body dimensions are length, 24 ft.; width, 7 ft.; and height, 6 ft. This gives a capacity of 1,008 cu.ft. The overhang back of the centerline of the rear axle is 8 ft. 7 in. The body has two refrigerator type doors, one at the rear and the other on the right or curb side to facilitate sidewalk deliveries.

The body is loaded from the rear at platform height at the Tobin plant. Depending upon conditions at the delivery points, it may be unloaded either from the rear or the side. The body itself is clear, with no inside partitions.

The body is fully insulated with Dry Zero, cork and Fiberglas. The roof insulation is 4 in. thick and the sides and ends, 3 in. The floor insulation is of cork, 4 in. thick.

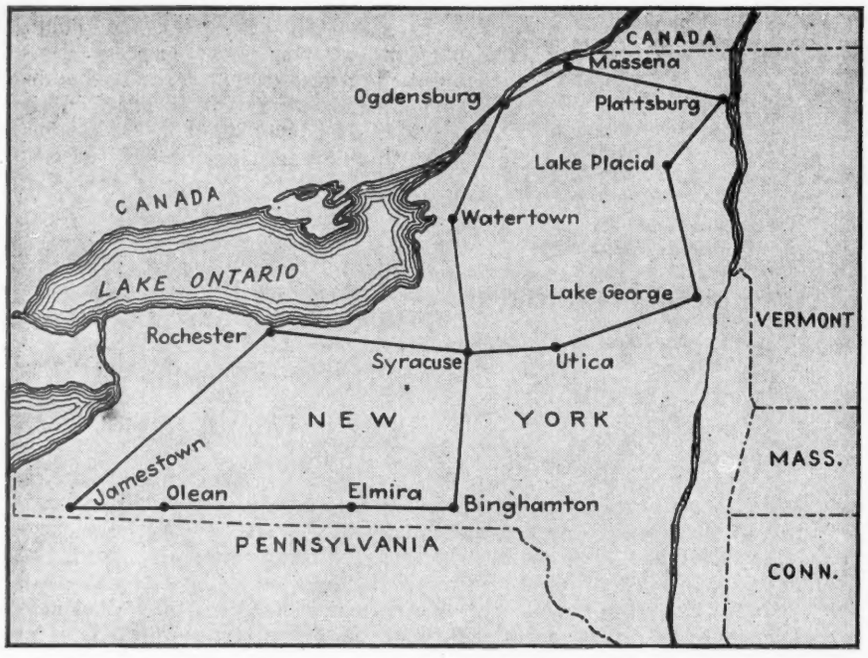
The bodies were made by Caley & Nash, Rochester, N. Y., and are fitted with a Whittaker-Upp electric refrigerating unit previously described in FOOD INDUSTRIES, January, 1942.

In the Whittaker-Upp system, a direct current, constant-voltage generator is driven in one of several different methods from the truck's engine. The current thus obtained is used to run a dual d.c.-a.c. motor, direct-connected to a compressor. This circulates the refrigerant through a system of coils in the truck body to provide the desired cooling action.

In the Tobin body, the constant-voltage generator is mounted on the truck frame on the right side just back of the driver's cab, and is driven off the truck driveshaft. The refrigerant compressor, its direct-connected motor, and the refrigerant condenser are located inside the truck body on the right hand side near the front. They are reached by a separate door on the right side panel, as shown in the photograph of the right side of the truck.

The refrigerating unit occupies a space inside the body 3 ft. long, 2 ft. high and 2½ ft. wide. The refrigerant used is methyl chloride.

The picture above, and the one on the following page, show the two sides of the same truck, illustrating the varied use made of the advertising display space. These 12½-ton Macks replace 8½-ton carriers making refrigerated deliveries of meat products.



From the company's packing plant in Rochester, the Tobin trucks made two and sometimes three deliveries per week along the routes indicated on this territorial map.

The cooling coils are mounted in the front of the body over the top of the driver's sleeping compartment. Between the coils and the front of the body, a circulating fan is mounted to distribute the cool air throughout the body.

The system maintains an interior body temperature of 40 deg. F. This is adequate to keep the frankfurters and other meat products in prime condition, no matter what the length of the delivery route, so long as the truck's engine is running. When the latter stops, the refrigeration stops.

To protect the load while the engine is stopped, as when the truck is being loaded or is stored overnight in the garage, a dual type direct-connected compressor motor is used. This can be run by either the direct-current furnished by the truck's constant-voltage generator, or alternating current used in most building lighting circuits. All that is needed is an ordinary lighting plug-in cable. This is provided on the Tobin body so that refrigeration is available around the clock.

In the Whittaker-Upp system, the power source is the truck's engine, or the plug-in cable connection to some available 120-volt lighting circuit. When the truck engine is running and operating the constant-voltage generator, the electric current produced is fed by cable to the compressor motor on much the same principle as used in the electric propulsion employed on the latest warships of the U. S. Navy. In the latter, steam turbines drive direct-connected generators, which supply current fed to motors mounted on each propeller shaft.

In the Tobin body, the same refrigerating result could have been obtained by a separate power source, other than the truck engine, such as a small gasoline engine operating the refrigerating compressor through a belt drive as commonly employed on ice cream delivery and other refrigerated body trucks. But in the Whittaker-Upp system the power transmission is electrical rather than mechanical.

The 24-ft. length and 6 ft. inside height of the Tobin body produces a long, low unit of striking appearance. In addition, the proportion of length to height has resulted in a lower center of gravity than with conventional two-axle trucks. This in turn has permitted greater road speeds with safety and a higher average road speed than with other trucks previously used on the runs.

As shown in the two accompanying illustrations, full advantage has been taken of the advertising value of the truck body. On a light colored background, large hand-painted lettering and pictures of the company's products can be seen blocks away. The advertising on the two sides is different. That on the left features the company's Arpeako frankfurts. On the right is shown a tempting view of one of their sliced tenderized hams.

By making the cab integral with the body, a sleeping compartment has been provided just back of the driver's seat. Use of these larger trucks has resulted in an estimated saving of 70 cents per 100 lb. The trucks average about 1,000 miles a week.

EDITORIALS

LAURENCE V. BURTON, Editor

In Retrospect

WE cannot let 1946 pass without noting two things which show how the food processor is gradually taking over the functions of domestic servants of former days. One was the 25th anniversary of the prepared baby food business, the occasion of a celebration on the part of Clapp's Baby Foods. The other was the increasing attention given to frozen, pre-cooked meals, originally for the airlines, more recently for the cabinets of the corner frozen food store.

The silver anniversary of prepared baby foods means permanent transfer of part of the nursemaid's job to the production superintendent of the baby food and junior food factory and his staff. The frozen complete meals continue the evolution begun with factory canning, which reduced the work of the cook. Pre-cooked meals eliminate the cook's work and the maid's as well. And if you accept the disposable plate, the scullery maid's job no longer exists.

In other branches of housekeeping, it is well recognized that electrical devices, automatic controls and functional design all play their part in the home in doing the work of the servants few can hire. They help to eliminate distasteful jobs and class distinctions. They also mean more equipment, more durable goods, more technology, more domestic service in the form of the "service" man who keeps the equipment in working order.

Some of this inevitable change means less ceremony, more doing of one's own work. The pre-cooked meal on plastic plates can be good eating although it hardly appeals as the event of the day in family circles. The labor saving sometimes reverses itself. It's a question of what labor is saved. The laundress doesn't call on the family any more. The family call with the wash where the laundress works. And if they use an automatic washer and drier, they are back to doing the whole job themselves, if with mechanical aids. The laundry man becomes the man who repairs the laundry machine.

There has been a good deal of sex reversal in the whole field of domestic service. The food processing factory is usually run by men, although the counterparts of the erstwhile domestics may be working on the filling lines. The lady-of-the-house, however, is more likely to take a position in the office. Or she may exploit her wartime experience as a welder or solderer and become a service "man" fixing the domestic electrical equipment.

The old domestic servants are gone, but new ones are on the job. The food processor is an important figure in the changing situation. His work lets the lady leave the house for longer.

Staphylococcus Food Poisoning

STAPHYLOCOCCUS food poisoning, discussed briefly by Professor G. M. Dack in this issue, is a delicate subject because of its medio-legal aspects. For that reason you may be forced to read between the lines to gain a full understanding of its importance. Some firms who have had past unfortunate experience with this organism have tried to laugh it off until they were forced to learn otherwise the hard way.

We suggest that the problem is, in the present state of knowledge, largely a problem of distribution. With proper and adequate temperature control clear to the consumer there is scant likelihood of toxin development. But such control may be impossible if, for example, the food is one that must be kept warm on a steam table in an eating place.

The problem is by no means simple, nor is the complete solution immediately foreseeable. But you are urged to read the discussion because the grief could hit your business some day.

Inefficiency in the Food Industry

UNIT labor costs—i.e. the labor cost per unit of production—have been rising alarmingly in all industry according to the Indexes of the Bureau of Labor Statistics. Even though these indexes have come in for considerable criticism in the recent Productivity Conference, they are all we have to go on at present.

Unit labor costs have gone from 100 in 1939 to a 1945 average of 139.9 in 10 major branches of the food industry. And our guess is that 1946 figures will be still higher. Ice cream has the only index that was below 100 in 1945. Compare this with the 132.0 average for 38 industries including food. In the use of labor, the food industry averages 8 percent less efficient than the average for other industries.

The cost of labor for manufacturing food has

risen faster and further than the average for all other products. Furthermore, the food figures top most other industries.

What should this mean to the food processor? Plenty, especially when, as Clarence Francis of General Foods recently pointed out, there will be less of the consumer's dollar available for food than heretofore, now that decontrol is here.

To meet this challenge and reduce unit costs for labor (not pay lower wages), the processor must review his manufacturing methods and discover new processes that require fewer man-hours per unit of production, or he may be forced to price himself almost out of the market. Materials handling, inspection and improved automatic control are places that seem most susceptible of improvement. Admittedly the food industries face one item of cost that seldom affects the other industries: sanitary control, but even this cannot explain the discrepancies.

Dependence on orthodox standardized equipment and methods, no matter how hard they are pushed, is not the answer. Wage cuts are not the answer. Sitting on one's spine in the front office awaiting the glad day when a salesman comes in with a needed economy is not the answer.

The solution will come to those firms who are imaginative, aggressive, who do not regard grandfather's way of doing things as a tradition that must be maintained. To survive, the industry's unit labor costs must be kept down at least to the level of all industry.

Let it never be said again that the food industry is less efficient than the non-food industries. It won't be easy to make the change but it can be done by research, technology, and sound engineering.

Why Meat Prices Are Declining

IF the populace is really alert to the times, all will have gained an important lesson in practical economics by living through the past few months. Some of the New Deal type of professional economists may also profit by recent experiences.

The chief lesson is that it is impossible to charge high prices for perishables (e.g. meat) unless the consuming public is willing to pay the price. When meat was finally decontrolled, prices went to fantastic heights. Ditto for the bid prices of livestock. Then the consumer rebelled. Housewives balked at retail prices. Retail butchers were stuck. Meat wholesalers were stuck. And many meat packers were stuck.

Fresh beef has a merchantable life of only about 30 days unless ruinous trimming costs are incurred, even when ultra violet rays are played on the meat in cold storage. Pork has a merchantable life of only about 16 days. Hence those who owned meats at prices too high to attract retail purchasers were forced to cut prices to move the goods. Then the retail selling price was finally reflected back to the slaughterer's bid to the owners of livestock.

Prices will slowly adjust themselves to whatever figure people are willing to pay and no artificial controls are as accurate as the automatically functioning interplay of supply and demand.

Where perishables are concerned it takes two to make the price: buyer and seller. Only where nonperishables are involved, can the seller adopt a "take it or leave it" policy. But, after all, there are relatively few things that are capable of being withheld without incurring a very considerable expense or depreciation as the months go by.

Surge Points Needed

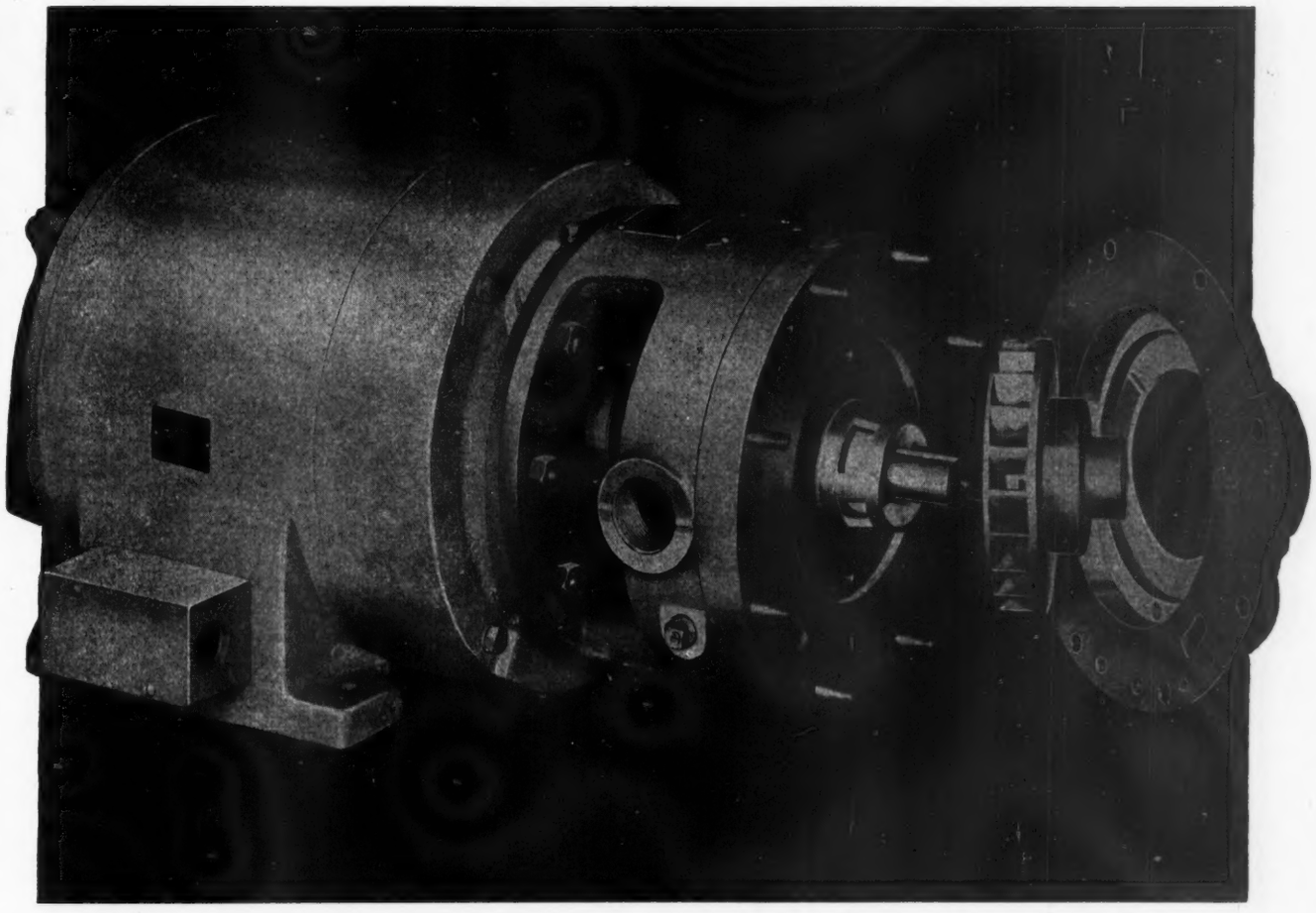
ONE of the important jobs in reviewing projected factory equipment and layout, is elimination of bottlenecks. Some prospective bottlenecks are so obvious that they can be spotted on a blueprint and corrected without difficulty. But sometimes one of the more difficult to foresee and incorporate in a future layout is that resulting from the failure to provide for proper "surge" points at a place where bottlenecks might occur.

If one stage of processing shuts down briefly, the material coming to that point soon piles up unless adequate provision has been made for such a contingency. In extreme cases the entire plant may shut down due to the failure of a single unit operation.

To prevent such occurrences, surge points should be provided at strategic locations in the plant, for diverting materials from the production line while adjustments, repairs or replacements may be going on at a subsequent process stage. When the trouble is corrected, the regular flow of goods is resumed. By placing a slight overload on the subsequent facilities, the stock that has accumulated at the surge point, can be gradually worked off. This is sometimes done by running the equipment at higher speeds. In other cases overtime is needed.

Regardless of how this is worked out, the important factor in food processing is to have a factory layout so that the operation may continue without waste or spoilage, and without undue extra labor cost.

The Nash Clean-Air Compressor has but one simple moving part.



The Nash Clean-Air Compressor has but one moving part, cast in one piece and rotating in the pump casing without metallic contact. No internal lubrication is necessary; therefore air or other gas compressed with a Nash is entirely free from oil contamination.

Dust and heat are removed from the air, or gas compressed, by the unique Nash "Liquid Piston". Air from a Nash Compressor is therefore delivered free from dust, heat, or oil, without supplementary filters or air washers, in a perfected mechanical structure with no internal wearing parts.

Air or gas from a Nash Compressor may be used for agitating, blending, maintaining pressure on storage tanks, or moving liquids and materials by pressure displacement, in connection with the most delicate food, beverage, or chemical process, without danger of contamination.

Bulletin D-252 tells all about Nash Clean-Air Compressors, and it is free on request.

THE NASH ENGINEERING COMPANY

SOUTH NORWALK, CONNECTICUT, U. S. A.

NEW PACKAGES & PRODUCTS

Double-Quick Apple Pie

FOOD manufacturers' chief concern at the moment seems to be the alleviation of the housewife's burden.

Latest indication of this is the introduction by General Mills, Inc., Minneapolis, of Apple Pyequick, a prepared pie mix complete with both pastry and filling.

The company's research laboratories began work on the product more than three years ago. Much of the ensuing time has been spent in perfecting a satisfactory method of processing apples for the filling. The method finally approved is a patented vacuum-drying process which reduces the moisture content of apples to approximately 1 percent, at the same time permitting them to retain their original shape and size, as well as the fresh apple flavor.

Directions for making the pie are simple. The dehydrated apples and ½ cup sugar are allowed to soak in water while the pastry mix is blended with water and rolled into crust. The mix is sufficient for a two-crust pie. Baking time required is 35 to 40 minutes.

The Betty Crocker product is packaged in a specially constructed carton, its brightly colored printing easily readable.

This new type apple pie that requires a minimum of time and effort from package to oven is the first of General Mills' postwar food products to be introduced to the American public.

Door-To-Door Sales

CAL-GROVE PRODUCTS Co., Covina, Calif., has spent many months planning the right container to be used for marketing its frozen fresh orange juice through home delivery.

A fiberboard carton, wax impregnated and having metal ends, was decided upon. It is the product of Continental Can Co. The 3-color label depicts a California orange grove scene, creation of Western Advertising Agency, Los Angeles. The pack holds 14 fluid oz.

Cal-Grove had several requisites for a container. It must be as easily and speedily handled production-wise as tin, it must withstand the same treatment as a bottle of milk and allow the frozen juice to thaw for use as ordinary juice.

The company plans to ship these retail size packages to dairy companies all over the country, claiming it can merchandise the item door-to-door anywhere, at a figure below the cost of fresh fruit to the consumer.

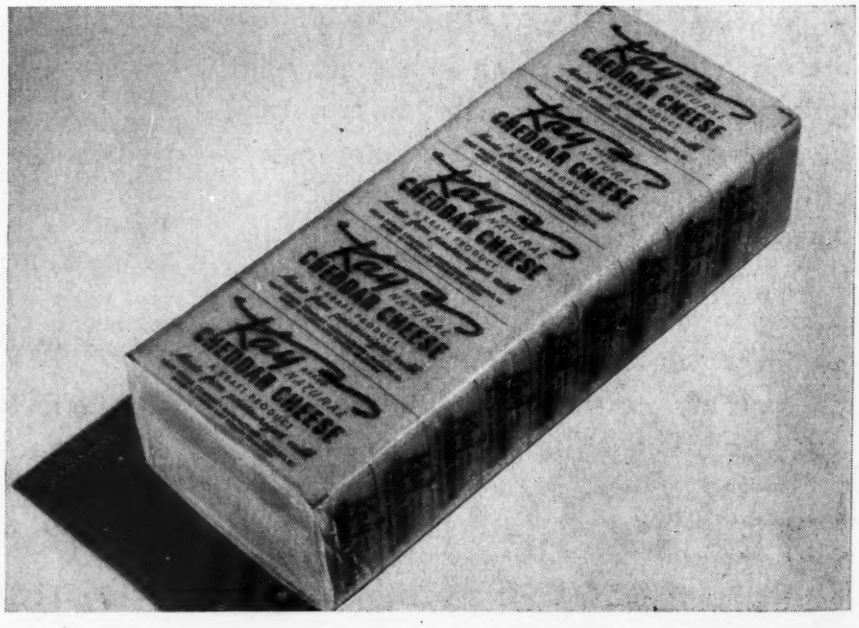
New Aging Process

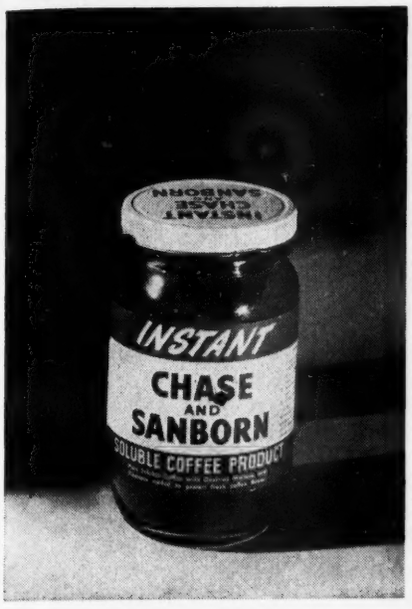
NATURAL American cheese that ages in its own transparent wrapper, thus eliminating thick rinds, paraffin and cheesecloth bandages, is now available on a national scale.

Kraft Foods Co. had the cheese ready for distribution in 1941 but the demands of wartime necessitated holding up production until now.

Made from pasteurized milk and packed in its final wrapper at the cheese factory, this new form of American cheese is sold in 10-lb. units, rectangular in shape, measuring approximately 14 in. long, 5½ in. wide and 3 in. thick.

Many cheesemaking, packaging and curing problems had to be overcome before full production could be started. American cheese formerly was made in various sizes and shapes ranging up to 80 lb. The new product, however, should provide the consumer with convenient sized slices for sandwiches and snacks.





More Soluble Coffee

STANDARD BRANDS' Chase and Sanborn Coffee now appears in soluble form.

It is packed 4 oz. to a screw-top jar and bears the familiar red, white and blue label. The metal top matches the decorative scheme, being white with red and blue printing—large enough to be plainly readable.

The soluble coffee product contains pure soluble coffee with dextrins, maltose and dextrose added.

Norway Uses Aluminum

NORWAY is one jump ahead of the United States when it comes to food packing in aluminum cans.

Sea Lord Brand Norwegian Sild Sardines have been appearing in this country's markets for the past several months. They are packed in aluminum containers of the usual flat sardine style.

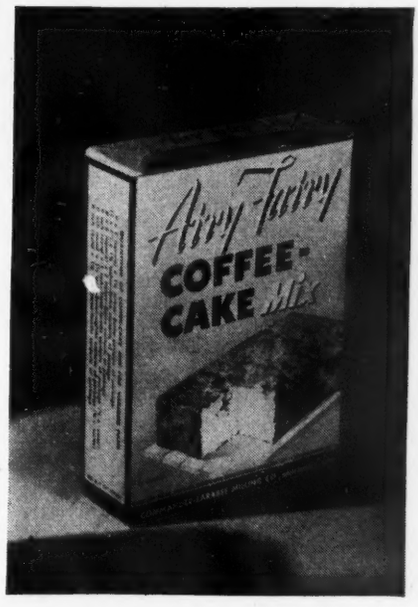
Because of the heavy strain imposed during shipment of goods, aluminum heretofore has been an unsatisfactory substitution for tin. This sardine can, however, is corrugated on sides and bottom so that it can withstand considerably more pressure than flat aluminum.

The sardines are packed by Nilsen Packing Co. Ltd., Stavanger, Norway.

Quick Coffee Cake

AND now the housewife can make coffee cake with little or no effort. There seems to be no end to food manufacturers' easy-mix ideas.

Airy Fairy Coffee Cake Mix is the brainchild of Commander-Larabee Milling Co., Minneapolis. It



contains flour, dextrose, shortening, dried skim milk, dried egg, soy flour, leavening and salt.

Packed 14 oz. in a paper covered carton, the mix is suitable for nut

LOW COST
ELECTRIC TEMPERATURE CONTROLS

Here is a simple, inexpensive electric control for heating and cooling operations that has proven its worth in some of the most exacting industries.

One of the largest and most modern plants making vitamins installed six Sarco LSI controls on steam heated stills a few years ago. They now have 142 Sarco controls in service in one plant.

High accuracy in chrome plating with alternate steam heating and water cooling is obtained at costs less than a third of the more complicated controls previously used.

The LSI is suitable for temperatures from minus 90°F. to plus 650°F. Ask for Bulletin No. 1025.

201

SARCO COMPANY, INC.
475 Fifth Avenue, New York 17, N. Y.
SARCO CANADA LTD. 85 Richmond St. W. TORONTO 1 ONT.

An Independent
• Laboratory
to meet the needs of your Organization

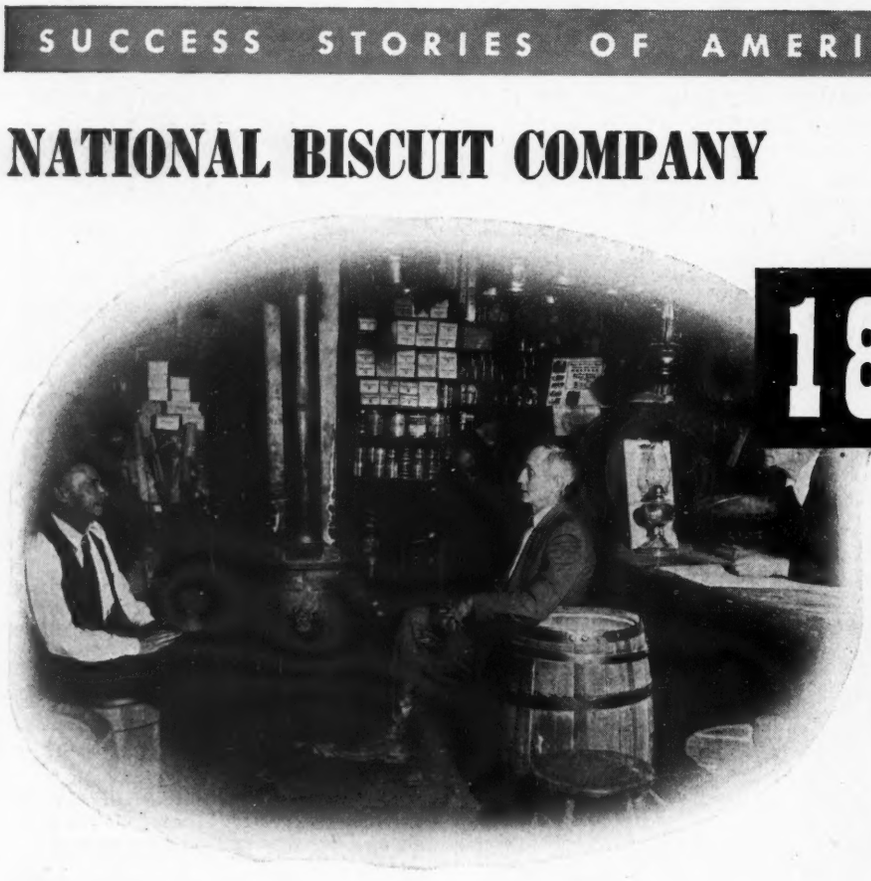
WE are eager to have your firm as one of our many clients and will be glad to advise you (without obligation on your part) as to how we can assist you in many matters requiring the work of an independent laboratory of established reputation and broad experience.

Food Analysis
VITAMIN DETERMINATION
Biological
Microbiological
Chemical
NUTRITIONAL STUDIES—RESEARCH
PRODUCT DEVELOPMENT
BACTERIOLOGICAL STUDIES
CONSULTATION
Labelling
Advertising

LEBERCO LABORATORIES
36 Roosevelt Avenue, Bloomfield, N. J.

SUCCESS STORIES OF AMERICAN BUSINESS

NATIONAL BISCUIT COMPANY



1899 . . . End of the cracker barrel

THE history of packaging is short. It was less than fifty years ago that the National Biscuit Company put an end to the cracker barrel by introducing their famous Uneeda Biscuit in a consumer unit.

The history of NABISCO is an example of both individual and company initiative . . . of the business progress and growth that has helped to make America great. NABISCO traces its beginning to 1792 when Theodore Pearson began making Pilot crackers. In1801 two other bakeries entered the field, and all three later became part of the National Biscuit Company. Invention of the reel oven during the Civil War made quantity production possible, and packaging later brought quantity production to the home in fresh, tasty and economical form.

Today, NABISCO owns and operates thirty-two bakeries in twenty-one states. About 1800 regular truck routes deliver NABISCO products to over half a million outlets.

HOW NATIONAL BISCUIT USES RIEGEL FUNCTIONAL PAPER

National Biscuit is one of our oldest customers for Functional Packaging Papers. Over the years, many millions of pounds of Riegel's Waxed Glassine have been used as carton liners to maintain the tasty crispness of NABISCO crackers. Other Riegel Papers, both printed and plain, are used as outer wraps; for bulk package liners and for many other products. Riegel Tympans are used on their printing presses and Riegel printing papers (supplied to manufacturers of office equipment) help to keep the intricate records necessary in so large a business.

Riegel Papers

FOR FUNCTIONAL PACKAGING

RIEGEL PAPER CORPORATION • 342 MADISON AVE. • NEW YORK 17, N. Y.

bread as well as coffee cake. Directions on one panel tell exactly how much of the mix to use for various sized pans.

A basic coffee cake is obtained by the addition of just ¾ cup of water. Suggested variations include raisin, nut or apple coffee cake, peach upside-down cake (requiring the addition of butter and sugar), and nut bread.

The product has been placed in a few markets on an introductory basis. Test areas are confined to Chicago and vicinity, the Twin City section in Minnesota, Milwaukee and upper Michigan.

Color Counts

EXCELLENCE in package design again is illustrated by Consolidated Biscuit Co., Chicago. A shopper, upon eyeing the bright box containing Crackin' Good Marshmallow Whips, will find it difficult to resist a purchase.

The lithographed folding carton is french blue with a silver plate of the chocolate marshmallow cookies. The effect is almost three dimensional—the color excellent.

Ingredients of these welcome sweet cookies include chocolate, corn sirup, flour, sugar, shortening, cane sirup, cocoa powder, gelatin, sweetened condensed milk, corn starch, salt, leavening, lecithin, soy protein, artificial flavor and pectin. Net weight is 12 oz.

Apple Nuggets

THE equivalent of approximately 4½ lb. of fresh apples may be purchased in a 6 oz. #2 can packed by The Appella Co., Selah, Wash.

Appella Apple Nuggets, for quick applesauce or pie filling, are tiny pieces of dehydrated apple of just the right tartness for cooking.

The can label is outstanding in its simplicity, the background being bright yellow with green printing. The only design is a small red apple. Suggestions for use and directions for making applesauce, pie filling and baked apple nuggets appear on the back.

QUICK SOURCE FOR
Inland Floor Plate

Super-Safe 4-Way Grip

Want protection against slipping and falling accidents in your plant? You get it with Inland 4-Way Floor Plate because projections grip from every angle; give much safer traction. Other advantages: Great strength and longer wear because rolled from tough, open hearth steel. Easy maintenance because pattern allows 4-way drainage. Call, wire or write the nearest Ryerson plant for prompt delivery.

JOSEPH T. RYERSON & SON, INC., Steel-Service Plants at: Chicago, Milwaukee, Detroit, St. Louis, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, New York, Boston, Los Angeles.

OTHER PRODUCTS:
Bars, Structurals, Plates, Sheets, Mechanical Tubing, Boiler Tubes, Alloys, Allegheny Stainless, Tool Steel, Babbitt, Reinforcing Bars, Bolts & Rivets, Metal Working Tools & Machinery, etc.

RYERSON STEEL

Design for Food Packaging

• Can we help you plan the packaging for the new products you are going to bring out — or restyle and modernize the packaging of your present products? . . . Our Design and Sample Department is now doing much forward work on Folding and Display Cartons and Shipping Containers for manufacturers of packaged goods. •

HUMMEL & DOWNING COMPANY
MILWAUKEE 1, WISCONSIN

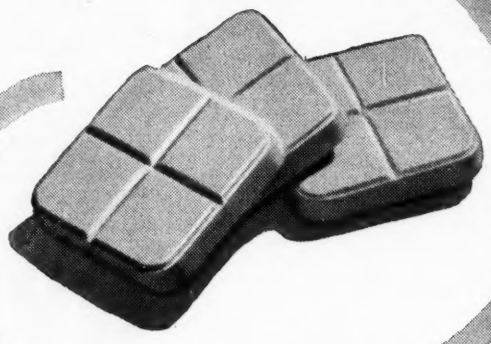
WASTE PAPER IS A VITAL RAW MATERIAL . . . SAVE IT . . .

To MACARONI *and* NOODLE MANUFACTURERS

To supply the best answer to manufacturers of macaroni and noodle products who will enrich their lines in accordance with the new Federal Standards of Identity, Hoffmann-La Roche has arranged for the marketing of:

'ROCHE' SQUARE ENRICHMENT WAFERS for batch mixing

1 wafer, to 100 lbs. of semolina, disintegrated in a small amount of water and thoroughly mixed in your dough, gives a macaroni or noodle product fully meeting the minimum FDA.requirements (per lb.—4 mg. vitamin B_1, 1.7 mg. vitamin B_2, 27 mg. niacin, 13 mg. iron). Only Roche makes SQUARE enrichment wafers designed for easier, accurate measuring and to mix in solution within seconds.



ENRICHMENT PREMIX CONTAINING 'ROCHE' VITAMINS

for mechanical feeding with any continuous press

1 ounce of this powdered concentrate added to 100 lbs. of semolina enriches to the same levels as above. We have helpful information on mechanical feeding equipment.

A postcard will bring you the names of companies for whom we manufacture wafers and whose enrichment premixes are made with 'Roche' bulk vitamins exclusively.

Consult the company with the widest technical experience in the improvement of food products by enrichment.

ROCHE *Vitamin Division*

HOFFMANN-LA ROCHE, INC., NUTLEY 10, NEW JERSEY

FOOD INDUSTRY NEWS

GENERAL

USDA's New Research Program Held Up By Battle For Control

Expansion under Flannagan-Hope Act not likely to get underway until beginning of new fiscal year, next June

IT is doubtful if the expanded research program authorized by the Flannagan-Hope Act will get underway before the beginning of the next fiscal year. The struggle for the control of the program is in full swing, within the Department of Agriculture, with the result that no concrete plan has been offered upon which to secure an appropriation early in the spring.

There has been no delay, however, in the appointment of the 11-man National Advisory Committee provided for by the legislation. It was announced by Secretary Clinton Anderson late in October. The committee members are:

H. E. Babcock, Ithaca, N. Y.; Fred Bailey, Washington, D. C.; Robert Coker, Hartsville, S. C.; John H. Davis, Washington, D. C.; Charles F. Kettering, Dayton, Ohio; C. W. Kitchen, Washington, D. C.; Albert Mitchell, Bell Ranch, N. M.; James G. Patton, Denver, Colo.; Walter L. Randolph, Fayette, Ala.; H. J. Reed, West Lafayette, Ind.; Kerr Scott, Raleigh, N. C.

The department has announced that, in addition to the National Advisory Committee, special committees will be appointed, in all probability, to assist in the development of research and marketing programs in particular fields or for special commodities. The department plans to call on these committees as well as farm groups, other federal and state agencies and private industry to lend aid in planning the work to be undertaken when funds are appropriated.

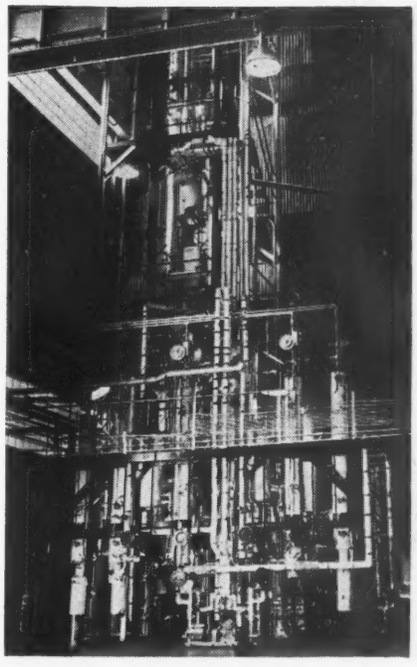
Sponsors of the enabling legislation, in the House Committee on Agriculture, put special emphasis on development of new uses for agricultural products "and the expansion of present uses and the improvement of marketing facilities and deserves to promote a sound, efficient privately-operated distribution system."

There are three schools of thought regarding the organization that should handle marketing research. Agricultural Research Administration seeks to handle the entire research program with the exception of the statistical studies which under ARA's plan would go to the Bureau of Agricultural Economics.

The Production and Marketing Administration, now floundering without a head and torn by internal strife, is bidding for the part of the program dealing with marketing research to bolster work in PMA as the action programs of the war years fade from the picture.

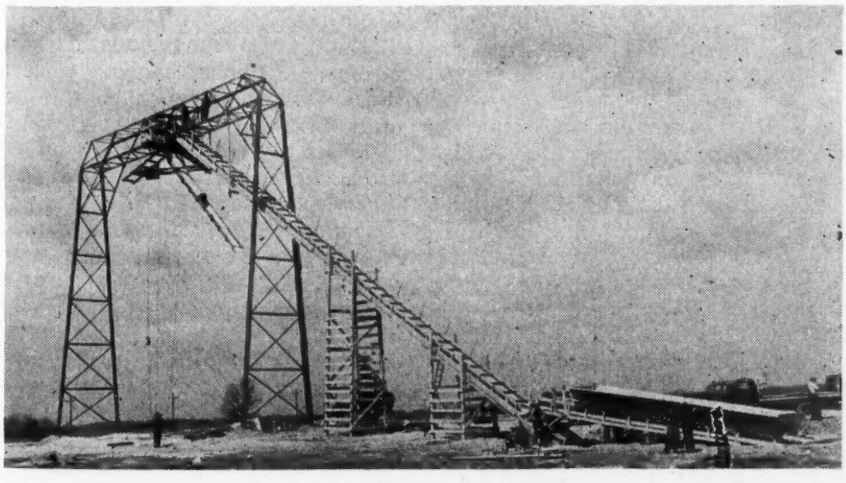
It was the desire of the House Agricultural Committee that a separate bureau be established to handle the marketing and regulatory work, with the work of the new bureau closely coordinated with that of the ARA. The establishment of the new bureau was agreed to by Undersecretary Dodd at the Senate Committee hearings. Those who favor a new bureau believe the staffs of PMA and ARA might be expected to neglect marketing in the future, just as it has been neglected by the same organizations in the past. Neither organization even knows the language or people of the industry.

The problems that are to be met and solved by the programs established under the authority of the



OIL REFINING

A new process for the refining of edible and industrial oils, known as the Solexol Process, has been developed by The M. W. Kellogg Co., whose pilot plant at Jersey City has been operating since the end of the war. It employs a liquid extraction and fractionation method using a nontoxic, noncorrosive and very stable solvent. This solvent circulates continuously through a closed system in intimate contact with the material being refined. **(Story on Pg. 126)**



STACKS FOOD WASTE MATERIAL

A new stacker, recently installed near the Deerfield Packing Co's. plant, Bridgeton, N. J., is equipped to handle a large volume of organic refuse from food packing operations. Formerly dissipated, this material is now stacked for ultimate return to the soil.

OVER 450,000 SOLD

• LOW COST
• SMALL SIZE
• LIGHT WEIGHT
• QUICKER HEATING
• ONE MOVING PART

Sold by more than 100 Mill Supply Distributors throughout the U.S.A. See your supply house or *write for Catalog* T-1739.

YARNALL - WARING CO.
127 Mermaid Ave., Phila. 18, Pa.

YARWAY
IMPULSE
STEAM TRAP

ALL IN A DAY'S WORK

Here you see most of the 162 baskets of tomatoes, recently picked one day by Mrs. Daisy Marvin, on a farm near Moline, Ill. Each basket holds 33 lb., which give the lady more than 2½ tons, a record until someone shows up with a better day's work.

new legislation have been described officially by the Department of Agriculture in exceptionally clear and concise language.

"It is now clear that unless marketing research shows us how to improve agricultural distribution processes, many of the improvements resulting from research on production will count for little. We have found that bigger and better crops may be a drug on the market. Until marketing and distribution are economical and orderly there will be unbalance and waste, and loss to both producer and consumer.

"Today there is relatively little information to be had on the costs, wastes, and weaknesses in the marketing and distributing of farm products.

GMA Meeting Features Worker-Employer Talks

PEACE in industrial relations depends upon the recognition of differing interests between parties who are mutually dependent upon one another, declared Prof. E. Wight Bakke, director of the Yale Labor and Management Center, in addressing the 38th annual meeting of the Grocery Manufacturers of America, at New York's Waldorf-Astoria, November 18 to 20.

The beginning of wisdom in these relations, Prof. Bakke said, is a clear-eyed recognition of these differences and an honest and dispassionate attempt to learn why they exist. You don't have to agree with what your employee believes or abdicate in the face of what he does, but if you understand *why*, your own action will be a lot more sensible and likely to get the results you are after.

Speaking from the other side of the same subject, Robert J. Watt, American Federation of Labor representative, said that both employers and workers must make every effort to provide machinery for the orderly and peaceful settlement of disputes, which cannot be settled by collective bargaining. To do a good job, he continued, labor and management must recognize their joint interest in improving methods of production and distribution and agree to work together to remove antagonisms and to establish a practical partnership that will advance their joint interests.

Details of a management training program, under which General Foods Corp. has trained 80 of its executives, were outlined by Austin S. Iglehart, president of the corporation. He said that management's job was to control its present operation and to look for and find opportunities for improvement. He showed how the series of conferences among company managers, from various departments, taking part in the training program, gave all a clear insight into the overall operation of the company.

As an official delegate to the International Labor Conference, in Canada, last September, Thomas R. Reid, director of human relations for McCormick & Co., Baltimore, emphasized his conviction that free

enterprise is fighting a last ditch battle for survival in the world here and now in the United States. He said that the other American delegates were equally disturbed by their observations that on the American frontier will be decided, in the years to come, whether or not free enterprise is to survive as a way of business. "We are an island of capitalism in a sea of collectivism," he added. He urged the grocery manufacturers to sell American free enterprise to the people in the same way they sell products.

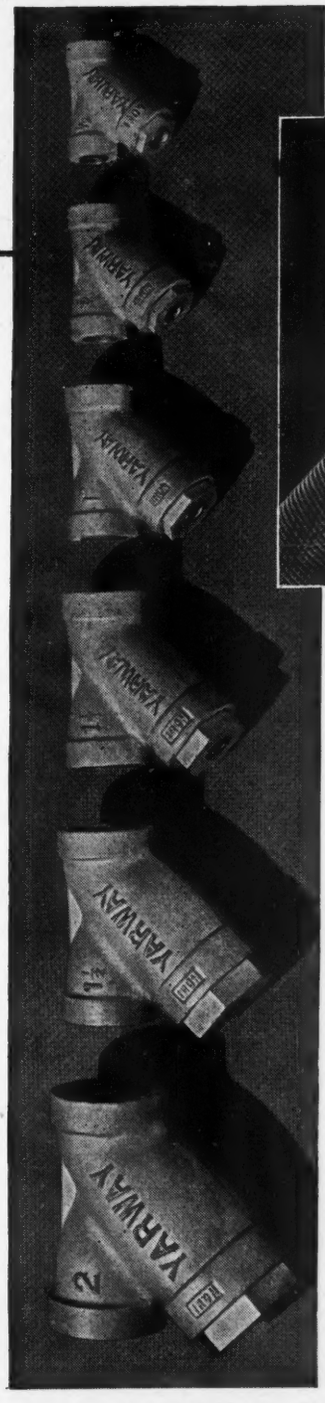
Jim Nash, noted package designer, demonstrated that distinctive design is more important on a package than a particular color scheme. He pointed out that overemphasis on color increases the cost of package production.

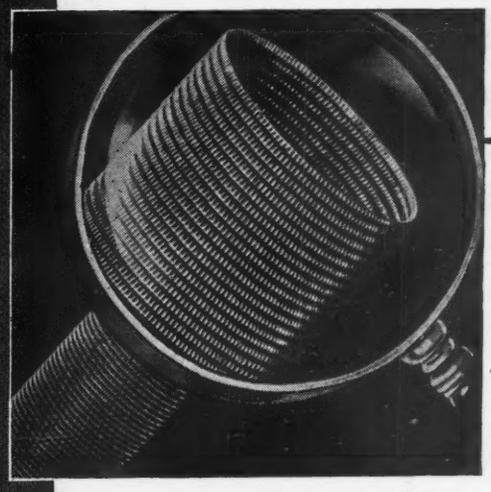
A. C. Nielsen, president, A. C. Nielsen Co., discussed the changes in buying habits of consumers. Many spectacular gains were made due to shortages of competing products, Mr. Nielsen pointed out. He felt that a large percentage of such gains would be held where the quality of the product warranted. He pointed to some of the pitfalls in postwar marketing that must be avoided by the food manufacturer. Among them, he advised caution in launching new products and invading competitive fields. Failure in these cases most often follows from the failure to gage the competitive conditions and failure to appraise properly the power of the originator's advantage. He also warned against the very serious dangers involved in misinterpreting the nature, the timing, and the degree of postwar slumps. Precipitous cutbacks in the face of inevitable sales declines can be very costly to management, who could thus be contributing erroneously to further declines.

PREVENT

Rust·Scale·Dirt

FROM CLOGGING STEAM EQUIPMENT





YARWAY STRAINERS

"The Screen's the Thing"

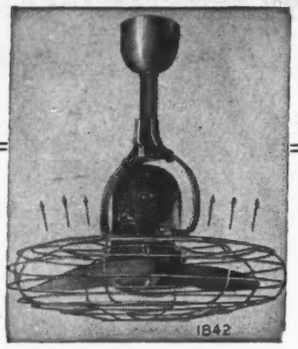
- *A High Grade Monel Woven Wire Basket* with mesh fine enough to catch the dirt—yet ample free area for passage of clean condensate, oil and other fluids.
- *Body Cadmium Plated for Protection Against Corrosion and for better appearance.*
- *Readily Removed Steel Blow-Off Bushing.*
- *Bushing Automatically Aligns Screen.*
- *Thousands in Use—Sold by Over 100 Mill Supply Houses.*
- *6 Sizes ½" to 2" for Pressures up to 600 Lbs.*

See Your Supply House or write for Bulletin S-201

YARNALL-WARING COMPANY

127 MERMAID AVENUE PHILADELPHIA 18, PA.

YARWAY STRAINERS



Reco RADI-AIRE

HEAT CIRCULATOR

PROVIDES UNIFORM HEAT
PREVENTS AIR STRATIFICATION
DISSIPATES SMOKE AND ODORS
ELIMINATES COLD FLOORS
DRIES UP WET WALLS & CEILINGS

This revolutionary new fan blows upwards, the air traveling along the ceiling down the walls and up the center again at slow motion giving complete and gentle air circulation in all parts of the room, without drafts. Write for Bulletin 221-A giving complete information.

REYNOLDS ELECTRIC COMPANY

Mfrs. of Refrigerator Fans, Fly Chaser Fans, Air Circulators, Food Mixers and Vegetable Peelers.

2668 W. Congress Street, Chicago 12, Illinois

SYNTRON

"Vibra-Flow"

VIBRATORY FEEDERS

With Rheostat Control of Volume Flow

SPEED UP YOUR MATERIAL HANDLING

Controlled volume feed of materials to screens, belt conveyors, pulverizers, dryers, etc.

Write for Illustrated Folder 9-46

SYNTRON CO.

460 Lexington Homer City, Pa.

Warns Against Coop Revision of Tax Laws

A WARNING to the food industry, as well as all business, to beware of the income tax compromises now being proposed by cooperatives came from the National Tax Equality Association, last month, in a reply to a coop proposal for revision of federal income tax laws. NTEA said that coops were not offering to pay taxes, but were proposing that all business adopts coop methods of evading taxation.

"For three years, the National Tax Equality Association has been leading the fight to make cooperatives pay income tax on earnings, just like other businesses," said Ben C. McCabe, president. "The cooperatives have constantly resisted; but now, when the battle is going against them, they are trying to confuse the issue.

"They are still unwilling to pay taxes, however. Instead, they are holding out the seductive claim that businessmen can escape their federal tax burden by paying their earnings to customers in the coop manner.

"Such a proposal challenges the very existence of the profit system, upon which American business has been built.

"If business should adopt this device and join the coops in evading federal income taxes, how would government pay its bills? The coops fail to say so, but $7,000,000,000 would have to be added to the tax bills of individuals, who are now paying more than they can afford.

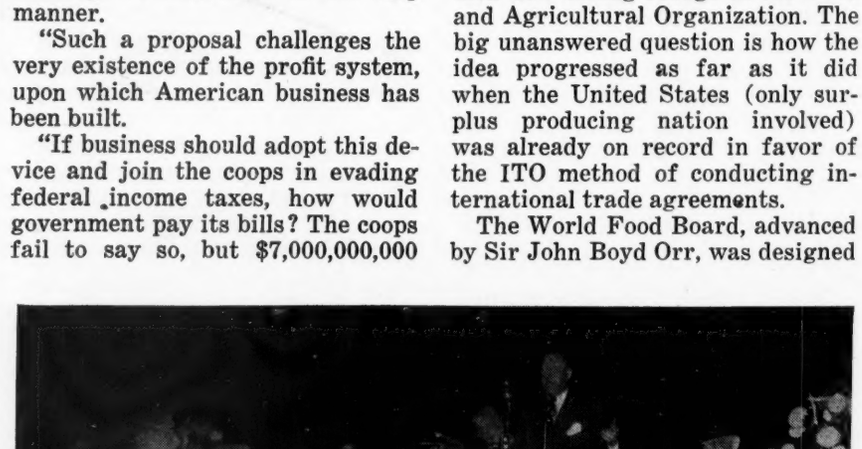
"Businessmen are willing to pay taxes necessary to support our government. We ask only that the cooperatives also pay their share, and that coop earnings be made subject to federal income tax before distribution."

Commodity Agreements Oust World Food Board

THE proposed World Food Board is a dead issue. U. S. representative, Under-Secretary of Agriculture Dodd gave the idea its death blow in which the British representative concurred perforce. In its stead the U. S. offered individual commodity agreements within the framework of the United Nations International Trade Organization.

Origin of the WFB idea is obscure. It is supposed to be of British birth, but because of its pure Henry Wallace ever-normal granary design it could well have been developed by some of the old Wallace men now taking refuge in the Food and Agricultural Organization. The big unanswered question is how the idea progressed as far as it did when the United States (only surplus producing nation involved) was already on record in favor of the ITO method of conducting international trade agreements.

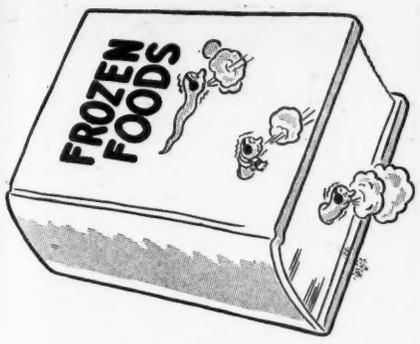
The World Food Board, advanced by Sir John Boyd Orr, was designed



Press Association

ONE OUNCE—$2.23

Pictures of this tidy animal appeared in most newspapers, late in October, but $42,600 worth of beef, on four legs, deserves more lasting treatment. The Williams Meat Co., Kansas City, Mo., paid the steer's Ida Grove, Ia. owner $35.60 a pound.



to stabilize farm prices in the international market by purchasing surpluses in good crop years and storing them for lean years. These buffer stocks could then be sold at cut rates to undernourished nations unable to finance their own requirements at prevailing prices. The alternative method, on which Uncle Sam placed his chips, permits the continuation of international commodity agreements, such as those that have been employed in sugar, coffee, rubber, tin and wheat to mention a few. The ITO includes special technics for handling food surpluses.

The simultaneous meetings of the preparatory commissions of ITO in London and WFB in Washington developed the appearance of collision between the two proposals to the embarrassment of the State Department. The blunt statement of Undersecretary Dodd made the U. S. position definite and strengthened the hand of the U. S. delegation in London. Actually all that the U. S. representatives on FAO had done previously was to endorse the idea of the desirability of stable agricultural prices and a well-fed world. This was on the order of a statement against sin.

In declining to go along with the World Food Board, the U. S. actually declined to join an organization in which it would be the only surplus producer and in which it would be dominated by consumer nations starting with Great Britain. Under the WFB plan, the U. S. would always pay the check.

Grants-In-Aid

SWIFT & Co. will again make available a limited number of grants-in-aid, to universities and other research institutions, for fundamental studies on agricultural products basically related to the business of the company. Directors of the company have appropriated $200,000 for continuance of the fund, which was inaugurated in 1943. In its first three years, Swift's placed 38 grants, totaling $600.000.

Here's the modern answer to all food conveying problems

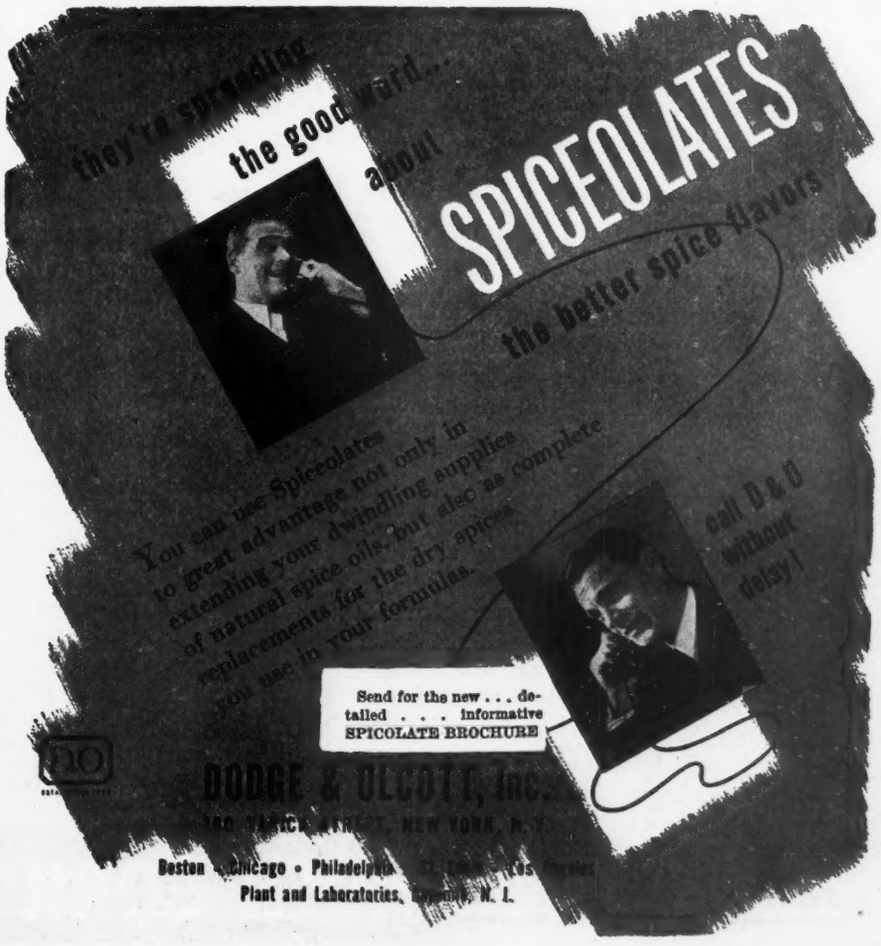
• PlasTex—The miracle belting with the plastic coating

Yes, now you can carry hot or cold, wet or dry substances of every nature month after month with this remarkable, fully pliable plastic coated belting. It won't pick up odors—cleans easily—lasts many times longer than uncovered belting.

Join leading food processors already enjoying the benefits of PlasTex in their plants.

Write for free sample and the name of your nearest supplier. Dept. C.

BUFFALO WEAVING & BELTING COMPANY
Chicago Buffalo 7, N. Y. New York
Serving Industry for Over Fifty Years


they're spreading the good word... about
SPICEOLATES
the better spice flavors
You can use Spiceolates to great advantage not only in extending your dwindling supplies of natural spice oils, but also as complete replacements for the dry spices you use in your formulas.
call D & O without delay!
Send for the new . . . detailed . . . informative SPICOLATE BROCHURE
DODGE & OLCOTT, Inc.
Boston • Chicago • Philadelphia
Plant and Laboratories, N. J.

For Insulation Jobs, too IT HAS TO BE RIGHT THE FIRST TIME

. . . and the first choice for the right insulating job is the Johns-Manville Insulation Applicator.

Even the finest insulation must be properly applied to provide maximum efficiency. That's why refrigeration engineers rely on the combination of J-M Rock Cork and the skill of J-M Applicators.

Basically mineral in composition, Rock Cork is made in both sheet and pipe-covering form. Both provide advantages that plant operators and engineers appreciate . . . low thermal conductivity, exceptional resistance to rot, moisture and vermin.

And you can be sure that Rock Cork will be applied to give you maximum use of its high insulating efficiency. Johns-Manville Insulation Applicators are fully trained in all phases of application. They employ only skilled mechanics and the most up-to-date methods of application.

Write for brochure DS-555, or see your J-M Insulation Applicator. Johns-Manville, Box 290, New York 16, N.Y.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville ROCK CORK

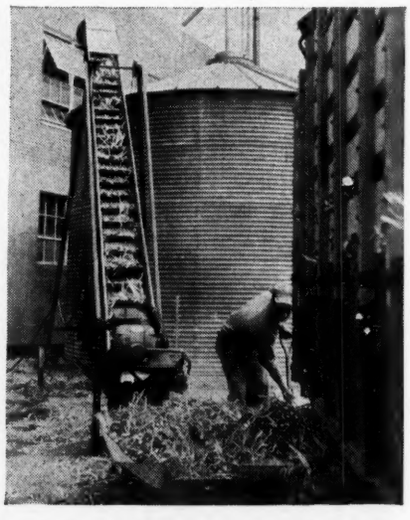
PROCESSING

Oil Extractor Method Ready For General Use

DEVISED originally for the recovery of vitamins A and D from fish oils, a new method of fractionating nonmineral oils has just been announced by the M. W. Kellogg Co. Development of the process was interrupted by the war, due mainly to the Kellogg company's engineering work for the Manhattan project.

The process, known by the trade name of "Solexol," is now ready for commercial application in many fields. It is based on the use of liquefied propane for the solvent extraction of animal and vegetable oils, a highly effective method of purification and separation that involves only low or moderate pressures and temperatures. A new pilot unit at the Kellogg company's Jersey City plant is now operating 24 hours a day, continuously processing edible and paint oils and tallow for use in soap. It will supplement the cost and operating data obtained from the first pilot plant.

General application of the Solexol process is expected to result in an improvement in the color and quality of nonmineral oils, in cost reductions and in larger potential production. Savings are indicated by the results obtained in the refining of sardine oil, of which Califor-



FUEL FROM WASTE

Corn cobs are here being delivered to the storage bin, at the Synthetic Liquid Motor Fuels semi-works plant, on the grounds of the Northern Regional Research Laboratory, Peoria, Ill. The cobs are transformed into such end products as xylose, furfural, butanol, acetone, alcohol and other products. Operation of this pilot plant will serve to establish maximum yields and will give a basis for computing costs.

"Mr. Service of Corning Glass to see you"...

BACK FROM THE WARS and back on the job are most of the Corning Field Research and Service men. Right now they are undergoing a "refresher course" here at the factory brushing up on all the new developments while they were away. Soon, however, they will be out on the road—calling on users of "Pyrex," "Vycor" and "Corning" Laboratory Glassware.

These men are direct factory representatives. They come to serve—not to sell. To bring you news of recent improvements, new discoveries, new methods. To obtain from you your opinion of recent developments and how Corning can make them still better.

Each man is a trained technician. He speaks your language. He understands your problems. His work combines both Field Service and Field Research. He calls on you in your laboratory to determine how Corning can serve you better. And, equally important, to gain new ideas, new suggestions from you. For from these first hand contacts of our field representatives has come the inspiration—the start—of much Corning Research in Glass—research that has constantly improved laboratory glassware and laboratory technique.

The card of the Corning field contact man is a card of cooperation. Any time you spend with him will, we know, be of mutual benefit.

T.M. REG. PYREX U.S. PAT. OFF.

Pyrex is a registered trademark and indicates manufacture by

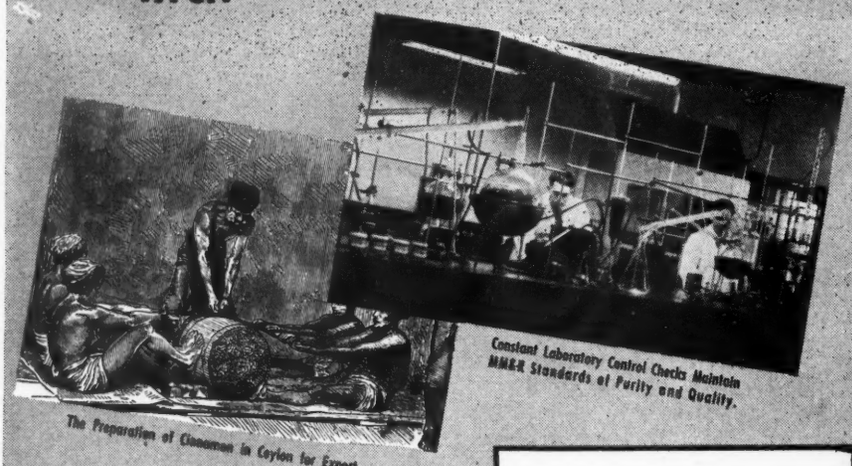
CORNING GLASS WORKS, CORNING, NEW YORK

FOR ALL-AROUND USE . . . YEAR 'ROUND ECONOMY

PYREX *brand* **LABORATORY GLASSWARE**

CORNING *means* Research in Glass

Which Has Greater Purity?



The Preparation of Cinnamon in Ceylon for Export

Constant Laboratory Control Checks Maintain MM&R Standards of Purity and Quality.

The Answer is one of 11 reasons Why You Should Use

MM&R SPICE OILS for MODERN FLAVOR CONTROL

Of course there's a distinct possibility of introducing dirt and other contaminating and mold-producing substances into your product when you use dry spices—a danger that you can eliminate entirely through the use of MM&R Spice Essential Oils and Spice Oil Mixtures. For MM&R *liquid* spices are uniformly pure and wholesome... the laboratory-distilled *essence* of natural spices, free from all extraneous matter.

And that's not all — highly-concentrated spice oils are more economical . . . easier to handle and store . . . provide uniform distribution of flavor without color disturbance.

These are just a few of the 11 reasons why producers find a *better* flavoring job is being done by Spice Essential Oils... *the MM&R brand* . . . pioneer and pacesetter in the field of Spice Oils for the food industry.

1. Uniformity of quality and flavoring
2. No color disturbance
3. Less bulk in storage
4. Less weight in shipping
5. No danger of molding
6. No loss by exposure in package while being stored
7. No starch introduced into your mixture
8. Ease of handling
9. Less cost as compared to equivalent spice value
10. Entire flavor available immediately
11. Elimination of the possibility of dust and dirt

Send for "Table of Equivalents" Showing Comparative Flavoring Strengths of Whole Spices and Spice Oils

MAGNUS, MABEE & REYNARD, INC.

SINCE 1895 . . . ONE OF THE WORLD'S GREATEST SUPPLIERS OF ESSENTIAL OILS

16 DESBROSSES STREET, NEW YORK 13, N.Y. • 221 NORTH LASALLE STREET, CHICAGO 1, ILL.

Los Angeles: Braun Corp. • Seattle, Portland, Spokane: Van Waters and Rogers, Inc.
San Francisco: Braun-Knecht-Heimann Co. • Canada: Richardson Agencies, Ltd., Toronto

nia produced 17,000,000 gals. in 1944. This oil contained vitamins worth $3,500,000, which previously could not be recovered. By the use of the solvent extraction process, a large part of the A and D values can be recovered as concentrate without impairing the properties of the oil. Complete processing actually yields one fraction with the properties of tung oil and another with linseed-like properties, which can be used as an extender or as a replacement.

In developing the process, Kellogg drew on previous wide experience in refining of petroleum. Propane is virtually a waste product available for less than 5 cents per gal. Solvent loss is small and its cost is thus nominal. A special unit of Kellogg, the Glyceride Processes Division, has been created for the exploitation of the new non-mineral refining system.

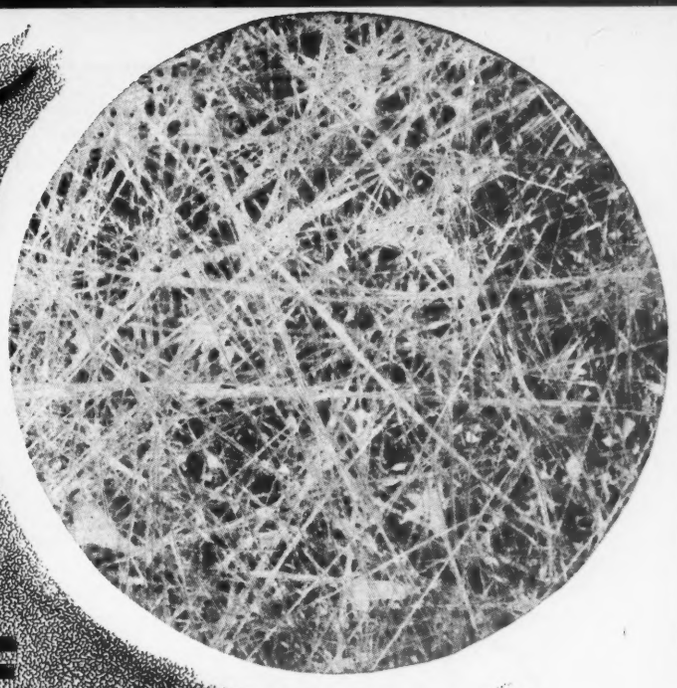
Improves Soya Oil

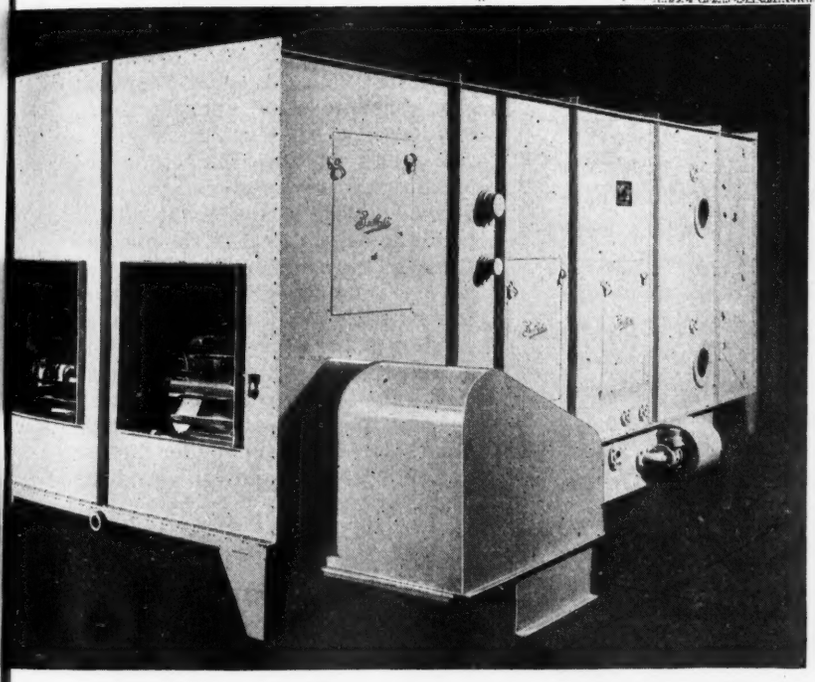
Advantages of the solvent fractionation method are especially apparent in the case of soybean oil, which hitherto has been considered inferior to cottonseed oil in flavor and keeping qualities. Soybean oil is nevertheless coming up even with cottonseed oil in annual production, which exceeds 1,000,000,000 lb. annually. Solexol refining improves the soybean oil. A first pass separates a pigment fraction amounting to 1½ percent, leaving the residue of 98½ percent decolorized and deodorized. On further refining a sterol fraction of about 1 percent is separated, which is important in pharmaceutical manufacturing. The refined soybean oil can be separated into two fractions, approximately one-third being a high iodine number oil for use in paints, and about two-thirds a low iodine number oil available for any purpose where edible oil is required.

Superiority of physical processing in comparison with conventional methods is seen in the refining of cottonseed oil. Hitherto it has been necessary to add alkali for neutralization and color improvement, resulting in production of a soap fraction. Separation of the soap by centrifuging usually results in loss of edible oil. Bleaching and absorptive clarification with carbon or clay are also resorted to. The alkali process causes obscure changes in the oil, which interfere with its keeping qualities. None of these handicaps is present with solvent refining.

Another application of the Solexol process is for the refining of tallow to be used in the production

DUST GETS OFF HERE





as "Buffalo" WET GLASS CELL AIR WASHERS *Condition Your Air*

The spun glass filter pictured above is a big reason why "Buffalo" Air Washers *save you money.* It's part of the remarkably thorough cleaning system in these quiet, trouble-free units. Constantly bathed in a curtain of uniform fine spray by improved "Buffalo" nozzles, these filters literally scrub your air free of dust . . . for the superior air conditions that mean *peak comfort, health and efficiency in your plant and office.*

"Buffalo" Wet Glass Cell Air Washers are easily installed, require little power for fan and pump, and their servicing is very simple.

Why not ask your local "Buffalo" representative about low-cost dust removal. Or simply write for Bulletin 3457 today.

BUFFALO FORGE COMPANY

152 MORTIMER STREET **BUFFALO, N. Y.**

Canadian Blower and Forge Co. Ltd., Kitchener, Ont.

"Buffalo" **WET GLASS CELL AIR WASHERS**

Deluxe
is the word . . .
for the PRODUCT and the PACKAGE

The J. B. Carr Biscuit Company has been making fine biscuits since 1870—and has seen to it that its packages express the quality for which Carr products are noted.

Like so many others who stress perfection in packaging, this long-established organization has standardized on Package Machinery Company machines.

For handling their wide variety of package sizes they've found the Model FA ideal, because this machine is quickly adjustable, and requires a minimum of supervision. Where printed transparent wrapping material is used, the FA is equally prized for its uniformly accurate registration of the printed design.

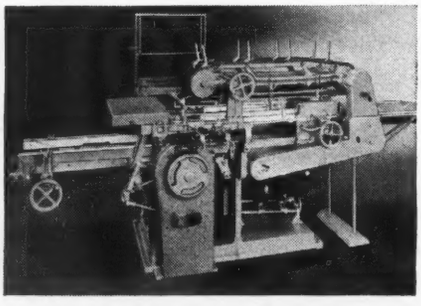
With a speed of up to 100 packages per minute, the Model FA will give you a welcome SAVING in wrapping costs as well as a package that SELLS.

Why not get all the facts about this most widely used of all wrapping machines?

Write for leaflet on the new FA

PACKAGE MACHINERY COMPANY • Springfield 7, Mass.

30 Church St., New York 7 • 111 W. Washington St., Chicago 2
101 W. Prospect Ave., Cleveland 15 • 849 Marietta St., N. W., Atlanta 3
443 S. San Pedro St., Los Angeles 13 • 320 Market St., San Francisco 11
18 Dickens Ave., Toronto 8



THE MODEL FA is quickly adjustable for a wide range of sizes. Can be adapted to virtually any plain or printed wrapping material.

PACKAGE MACHINERY COMPANY
Over a Quarter Billion Packages per day are wrapped on our Machines

Wide World

NEW ARMY RATION

A new five-in-one ration that includes fruits for the first time, will feed small groups of soldiers, separated from their kitchens, in the 1947 training and field operations of the U. S. Army. They expect to use 1,500,000 units. The rations are so packaged that they may be readily made up into five precooked breakfasts, dinners and suppers, to be eaten hot or cold.

of white soap. A counter-current and continuous solvent extraction method is used.

Samples of the Solexol refined oils are now on test for products using edible oils and paint oils, it being understood that the process meets all requirements, without disadvantages having been encountered. Although the process can go on-stream for long periods, it will also handle relatively small quantities. The Kellogg Co. will not itself operate the process, but will build plants for operation under license by oil refiners and oil products users.

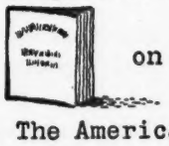
Pickle Packers Study Model Sanitary Plant

THE National Pickle Packers Association, meeting in Chicago, in late October, received a code of specifications for a model sanitary pickle factory. An outline of the factors involved in such a plant from the point of location, surroundings, construction, lighting, ventilation, equipment, maintenance and personnel is included in the packer's code. Changes, based on member manufacturer's experience were asked for by Olney Brown, chairman of the research committee.

Dr. F. W. Fabian of Michigan State College and Dr. John L. Etchells, Department of Agriculture collaborated with the association's research committee to produce the finishing plant code.

A one year fellowship at North Carolina State College, Raleigh,

"SAVING" IS THE WORD FOR STAINLESS

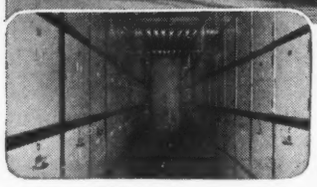
This durable, rustless steel in food processing equipment saves you money, time and trouble. Food stains come off its gleaming surface like magic. This saves clean-up time. ARMCO Stainless is beautiful and rustless metal, all the way through. Replacements and repairs are fewer. It will not harbor bacteria and is not affected by sterilizers. It helps protect vital color and taste. It is highly resistant to corrosion and wear, assuring many years of satisfactory service. These are some of the advantages that make Stainless Steel the preferred metal in leading dairies, bottling plants, packing houses and food processing plants of every kind. If you're planning to expand your plant or replace existing equipment, let Stainless cut your processing costs. . . . You'll find many helpful tips in a booklet published by Armco  on the "Care and Uses of Stainless." Write for your free copy today. The American Rolling Mill Company, 4121 Curtis Street, Middletown, Ohio.

Export: The Armco International Corporation.

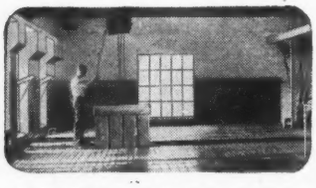
THE AMERICAN ROLLING MILL COMPANY

ARMCO

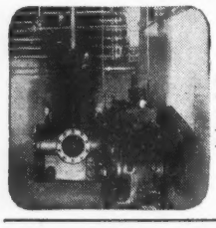
- SPECIAL-PURPOSE SHEET STEELS
- STAINLESS STEEL SHEETS, BARS AND WIRE



Typical Aisle in Locker Room, which has 1675 Compartments



Labor-Saving Equipment Harvests Four Ice Cans at Once



One of Seven Frick Machines

Georgia Community Refrigeration Center Makes Remarkable Growth

The City Ice Company of Gainesville started in 1929 with a 20-ton ice plant. Today it provides complete refrigeration services and operates 8 additional plants throughout Georgia, all being developed into Community Refrigeration Centers.

The original plant now makes 72 tons of ice daily; rents 1675 lockers; provides food processing and pork curing; operates extensive cold storages; quick-freezes up to 30,000 lb. of poultry per day; ices railroad cars and trucks; and sells refrigerators and appliances. The first Frick machine is still in continuous operation, six more have been added in this plant, and 15 more in the other plants.

What could a similar Community Refrigeration Center do for YOUR area? The nearest Frick Branch Office will supply details, or write

DEPENDABLE REFRIGERATION SINCE 1882

FRICK CO.

WAYNESBORO, PENNA. U.S.A.

LEE

CORROSION-RESISTANT EQUIPMENT

- Heavy Duty Jacketed Kettles Stainless Steel, Pure Nickel or Monel
- Super-Jacketed Kettles Stainless Steel, Pure Nickel or Monel
- Agitators Stainless Steel
- Storage Tanks Plain, Jacketed or Insulated Stainless Steel, Pure Nickel or Monel
- Pulp Tanks Stainless Steel
- "No-Coil" Heating Tanks Stainless Steel, Pure Nickel, Monel
- Vacuum Pans Stainless Steel
- Plug Valves—Flush Type Stainless Steel, Pure Nickel, Monel

... in Standard Sizes or designed to Specific Job Needs

LEE METAL PRODUCTS COMPANY, INC.

408 PINE STREET • PHILIPSBURG, PA.

N. C., for complete research on cucumber seed was approved by the association. Knowledge of disease resistant seeds and improved quality in yields of various strains of seeds will be compiled for reference and nation-wide use by the pickle packing industry.

Lewis Hirsch, Louisville, Ky., association president, recounted the rise in pickle consumption from an average of 5,000,000 bu. in the 1930's to an average of 7,250,000 bu. during the war. President Hirsch urged members to continue product improvements especially in view of prospective future consumption.

The 1946 pickle crop is the largest in the history of the country, totaling 8,500,000 bu. With many wartime restrictions removed, pickle packers can supply more of the unfilled demand of war years, Hirsch said.

Propose New Standards For Green, Wax Beans

THE proposed order for standards of identity and quality for canned green beans and canned wax beans were printed in the Federal Register for October 25. The new standard of identity supersedes the old standards promulgated in 1940.

The quality standards consider the following undesirable features: Small pieces (less than ½ inch long), seed and pieces of seed, string, fibrous material, blemished units, unstemmed units, and extraneous vegetable matter. Maximum permissible contents of these various undesirables are specified. Detailed testing methods are also prescribed, and if the quality of the beans falls below the standard prescribed "the label shall bear the general statement of substandard quality."

It is proposed that this regulation shall become effective April 1, 1947. Any interested persons whose appearance was filed at the hearing may file exceptions to this proposed order prior to December 10.

Georgia Plans 5-Year Food Research Program

FARM scientists of Georgia plan a $1,000,000 research program, during the next five years, to process and introduce to consumers certain home-grown produce, which has never been on the market before in large amounts.

At a meeting held at the Experiment Station, near Griffin, scientists and educators of the University System proposed no less than 70 projects to raise state farm levels. Director H. P. Stucky said that a

THE P.D. STANDS FOR *Planned Distribution*

UNIQUE SERVICE HELPS YOU PLACE YOUR PRODUCTS IN THE *Proved* SALES VOLUME AREAS

Can you select, without help, the localities in this market that will buy most of your goods? Can you pick the dealers who will sell most? The Plain Dealer Market Survey department *can* answer these questions... factually and accurately. Base your advertising and marketing plans on these answers and you'll realize maximum sales. Call or write your PD representative for an appointment to receive this *individualized* service.

The Plain Dealer is Enough —if You Use It Enough

Plain Dealer circulation is greatest in the areas where your sales possibilities are the best. The P.D. 2-in-1 market (Greater Cleveland plus the 26 adjacent counties) gives you Ohio's *two* richest markets at one low cost.

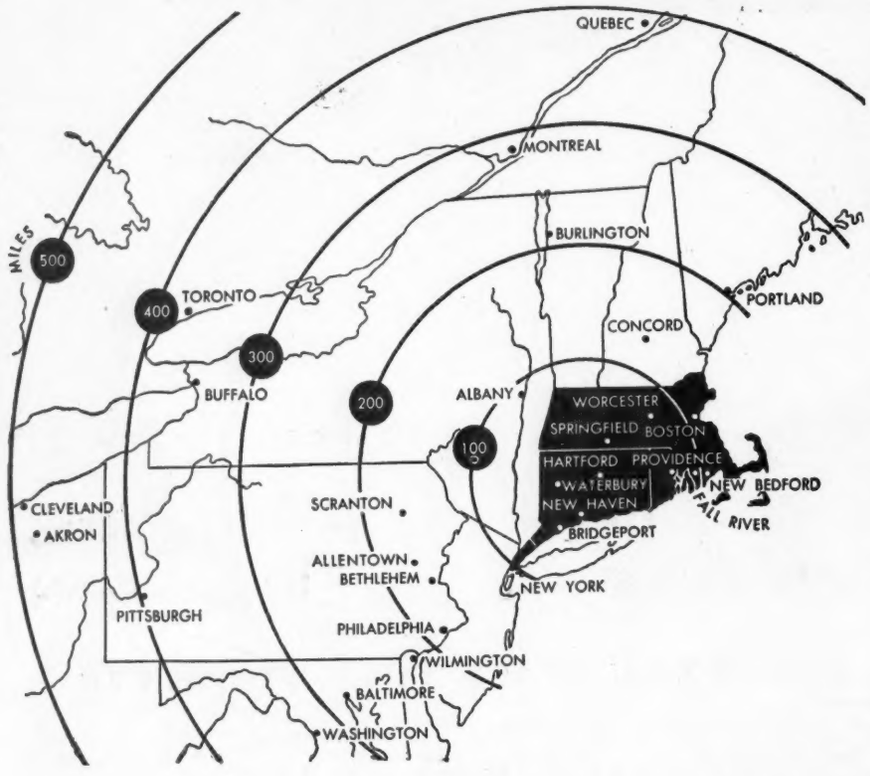
CLEVELAND

PLAIN DEALER

Established in 1842

John B. Woodward, Inc., New York, Chicago, Detroit, San Francisco, Los Angeles
A. S. Grant, Atlanta

Looking for Bigger Markets?



35 of America's 100 largest cities are within 500 miles of the center of Southern New England.

Within this same 500 mile radius live 58,317,815 people with the highest potential buying power in the world. One indication of the sales opportunities which exist here is the fact that the U. S. portion of this fertile market paid 50% of all income taxes received by our Federal Government.

Easy access to millions of people with money to spend is one of many factors in your favor when you locate your industry in Southern New England.

For a complete, factual resume of *all* advantages, write for the new 32-page booklet, "SOUTHERN NEW ENGLAND FOR TOMORROW'S INDUSTRY." Address: P. E. Benjamin, Mgr., Industrial Development, New Haven R. R., Room 201K, 80 Federal Street, Boston 10, Mass.

THE NEW HAVEN R. R.

SERVING NEW YORK AND THE GREAT INDUSTRIAL STATES OF MASSACHUSETTS, RHODE ISLAND AND CONNECTICUT

production line will be setup to process 25 tons of muscadine grapes for consumer markets. Kiefer pears will also be processed for wide markets. Dr. Stucky pointed out that the five-year program is now in the making and projects will be ready to take advantage of funds to be appropriated by the next Congress under the Flannagan-Hope Act, which enables the federal government to appropriate a total of $20,000,000 during the next five years for agricultural research. States must match sums allocated by the government.

Best Foods Triples Size of Dallas Plant

PLANS for the construction of a greatly-expanded plant to house the Dallas, Tex., operations of Best Foods, Inc., have been revealed by Adolph Weber, local manager, with the leasing of a four-and-one-half acre tract.

The new plant will have 40,000 to 50,000 ft. of floor space as compared to the 16,000 in the present rented quarters.

H. B. Viedt of New York, vice-president and production director of the company, who signed the long-time lease on the new location, said the proposed construction is the first step in the company's southwestern expansion plans.

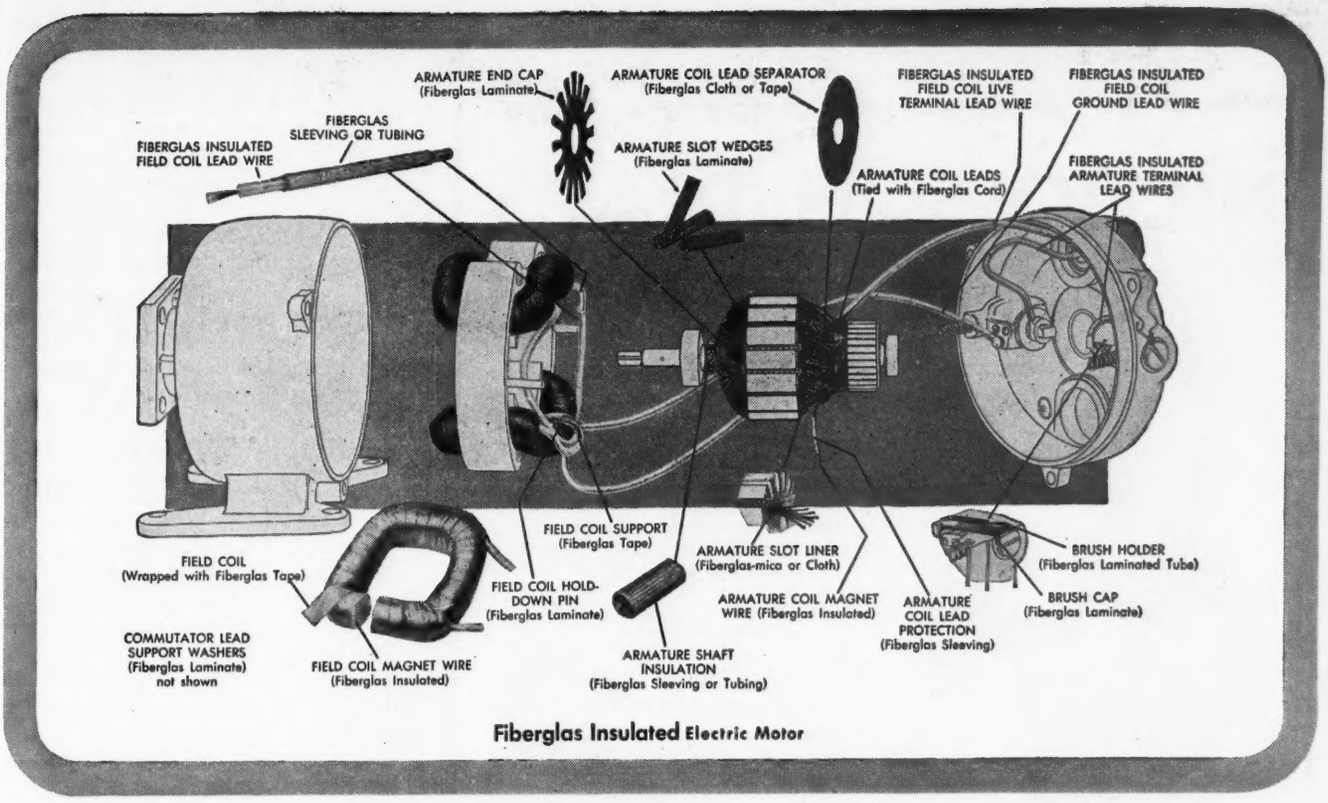
The new one-story plant, which will be constructed as soon as materials and equipment are available, will serve Texas, Oklahoma, Louisiana and parts of Arkansas and New Mexico.

The Dallas branch at present manufactures only mayonnaise and salad dressings, but newly developed food products will probably be manufactured at the new plant, officials said.

This branch is Southwest distributing center for Nucoa and bread and butter pickles, produced by the company, and the sales and distributing offices are expected to be located in the new plant, Weber said.

Processes Studied At Canned Pea Hearings

ONLY two days were required, early in November, to present a proposed amendment to the canned peas standard of identity. Two processes, those of Schroder and Stevenson, were introduced by their proponents and advocates. Both claimed that color retention and improved flavor result when their processes are used. Although similar in general to the Blair process, which was the subject of an amend-


ARMATURE END CAP (Fiberglas Laminate)
ARMATURE COIL LEAD SEPARATOR (Fiberglas Cloth or Tape)
FIBERGLAS INSULATED FIELD COIL LIVE TERMINAL LEAD WIRE
FIBERGLAS INSULATED FIELD COIL GROUND LEAD WIRE
FIBERGLAS SLEEVING OR TUBING
FIBERGLAS INSULATED FIELD COIL LEAD WIRE
ARMATURE SLOT WEDGES (Fiberglas Laminate)
ARMATURE COIL LEADS (Tied with Fiberglas Cord)
FIBERGLAS INSULATED ARMATURE TERMINAL LEAD WIRES
FIELD COIL SUPPORT (Fiberglas Tape)
ARMATURE SLOT LINER (Fiberglas-mica or Cloth)
BRUSH HOLDER (Fiberglas Laminated Tube)
FIELD COIL (Wrapped with Fiberglas Tape)
FIELD COIL HOLD-DOWN PIN (Fiberglas Laminate)
ARMATURE COIL MAGNET WIRE (Fiberglas Insulated)
ARMATURE COIL LEAD PROTECTION (Fiberglas Sleeving)
BRUSH CAP (Fiberglas Laminate)
COMMUTATOR LEAD SUPPORT WASHERS (Fiberglas Laminate) not shown
FIELD COIL MAGNET WIRE (Fiberglas Insulated)
ARMATURE SHAFT INSULATION (Fiberglas Sleeving or Tubing)

Fiberglas Insulated Electric Motor

WHEN MOISTURE CUTS PRODUCTION, USE "HIGH-SAFETY-FACTOR" INSULATION

When high humidity attacks the efficiency of electrical equipment, *extra protection* is needed for motors, generators and transformers. In many food industry processes, Fiberglas "High-Safety-Factor" Insulation Materials, resistant to moisture, are helping reduce costs caused by "burnouts" and rewind delays in both new equipment and maintenance work.

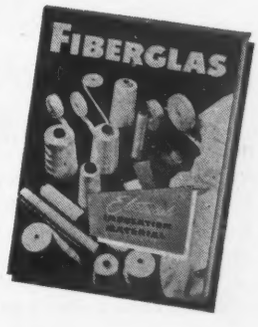
These insulating materials are made from fibers of glass that are unaffected by moisture, oil and corrosive acids or vapors. They possess high heat resistance and great tensile strength, providing a strong, thin, flexible base for insulating impregnants.

The cost of the extra protection afforded by Fiberglas Insulation is slight—only a fraction of the cost of the original equipment. Invaluable savings in time and machinery more than offset the cost of Fiberglas.

Fiberglas Electrical Insulation Materials are sold nationally by leading distributors and are available in the form of laminates, mica combinations, insulated wire, treated or untreated tying cords, braided sleevings and cloths.

Ask your Fiberglas Distributor for the complete story on the use economies of Fiberglas. Add the "extra" protection of "High-Safety-Factor" Insulation to your electrical equipment.

Here is performance and application data about Fiberglas that may help solve your insulation problem. Write today for the new Fiberglas Electrical Insulation Materials catalog EL46-11. Owens-Corning Fiberglas Corporation, Dept 2009, Toledo 1, Ohio. Branches in principal cities.
In Canada: Fiberglas Canada Ltd., Toronto, Ontario.



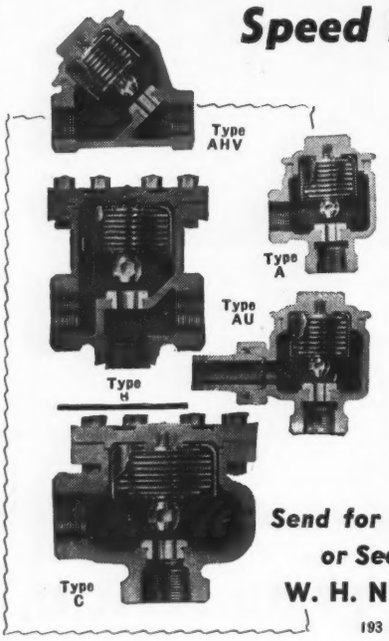
ASK FOR FIBERGLAS IN YOUR NEW MOTORS—AND ON YOUR NEXT REWINDS

OWENS-CORNING
FIBERGLAS
REG. U.S. PAT. OFF.

OTHER FIBERGLAS PRODUCTS: Thermal Insulations • "Dust-Stop" Air-Filters • Fiberglas Yarns and Cloths • Fiberglas Mats

6 "Power-ful" Reasons Why NICHOLSON TRAPS

Speed Steam Circulation



1. BIG DISCHARGE CAPACITY, 2 to 6 times average traps.
2. NO AIR BINDING. Discharge air as efficiently as water.
3. NO FREEZE-UPS. Drain completely when cold.
4. NO DRIBBLING. Close when steam contacts bellows.
5. NO ADJUSTMENT NEEDED, vacuum to maximum pressure.
6. NO WATER-LOGGING. Few degrees change opens valve.

Five types: size 1/4" to 2". Pressures to 225 lbs. Low cost.

FLOATS — Stainless, Monel or chromium-plated Steel; all sizes, pressures.

Send for Catalog 444 or See Sweet's

W. H. NICHOLSON & CO.

193 Oregon St., Wilkes-Barre, Pa.

TIDEWATER RED CYPRESS

Is the Answer to Any Problem of DECAY, ODOR, TASTE or ACID!

...Its Superior Qualities Make It Ideal for a Wide Range of Industrial Uses

The Indians knew it, the Spaniards knew it, the French knew it, and those of English decent of the Southeastern regions have known for 150 years the superior qualities of Tidewater Red Cypress and its resistance to decay. Along the Atlantic Coastal Plain where lie buried cypress trees that grew over 100,000 years ago in the Pleistocene Age, many of which have since been dug up, give mute evidence of the lasting qualities of cypress never equalled for its decay resistance. In more recent years industry has also learned that it licks the difficulties of odor, taste and acid. Tidewater Red Cypress has ALL the qualities you demand for many specific industrial demands.

Tidewater RED CYPRESS

Tide Water Red Cypress "The Wood Eternal"

CAN BE FURNISHED FROM ST. LOUIS STOCKS

FLEISHEL LUMBER CO.

4230 DUNCAN AVE. • ST. LOUIS 10, MO. • NEwstead 2100

ment to the standard several years ago, the specific alkalis used and the modes of application differ.

Food and Drug Administration officials did not present any testimony in opposition to the applicants. Cross examination was employed primarily to clarify the record where necessary.

Briefs supporting the proposals, or in opposition to any point that was raised during the hearing, may be filed by December 9 by those whose appearance was registered at the hearing.

Vegetable Milk Helps India's Short Supply

A PROPOSAL for the manufacture of milk from vegetables has been made to the Food Department of the Central Government as a means of remedying the low milk consumption levels in India. The plan is based on research conducted by Prof. V. Subrahmanyan of the Department of Bio-Chemistry in the Indian Institute of Science, Bangalore.

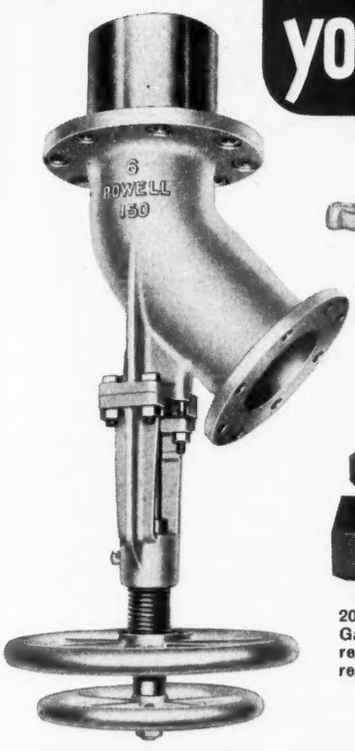
Prof. Subrahmanyan reports that soya bean milk is the most promising of the vegetable milks, having 80 percent of the over-all food value of good cow's milk and increasing this when mixed with 25 percent by volume of cow or buffalo milk.

Even greater than its nutritive rating in the scale of comparative values is the fact that it costs only a third as much to produce as regular cow's milk—an important fac-

WEEKLY SHIPMENTS

Air freight shipments of fresh and frozen foods between Los Angeles and Alaska have become a regular weekly service of American Airlines. In return for the California produce, being used to advantage here by the stewardess, Alaskans provide fresh sea food, which can be placed on L. A. tables 12 to 18 hours after leaving Alaskan waters.

POWELL has the *right* Valves for *all* your Flow Control requirements!



150-pound Stainless Steel Flush Bottom Tank Valve with Powell Patented Seat Wiper.

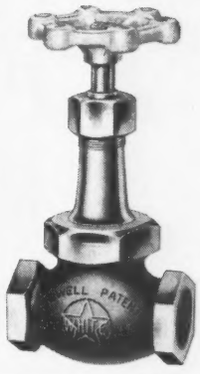
200-pound Bronze Gate Valve with renewable, wear-resisting disc.

This may sound like a broad statement—but we can back it up. Because, through 100 years of making valves—and valves only—Powell has always been ready with valves that are *right*—in both design and material—to meet *all* demands imposed by the amazing growth of American Industry.

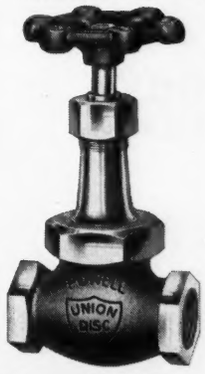
Today the Powell Line includes Bronze and Iron Valves of every necessary type, size, design and working pressure; Cast Steel Valves of every type in pressure classes from 150 to 2500 pounds; and a complete line of Corrosion-Resistant Valves, including many special designs and made in the widest range of pure metals and special alloys ever used in making valves.

The Wm. Powell Co., Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

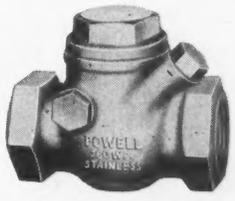


200-pound Bronze Globe Valve. Renewable, wear-resisting, semi-cone plug type seat and disc.

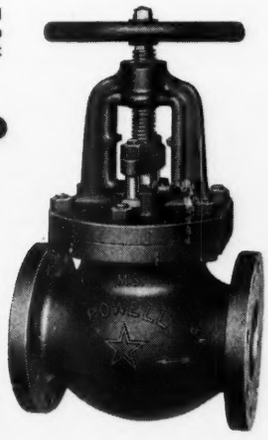


150-pound Bronze Globe Valve with renewable composition disc.

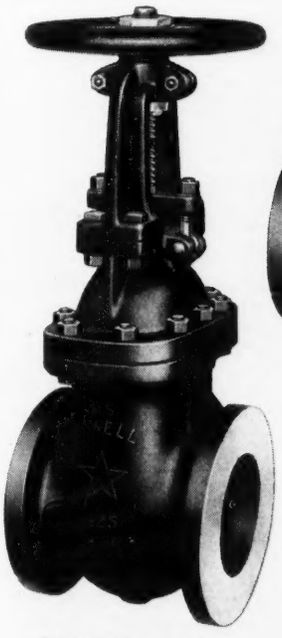
Catalogs furnished on request. Kindly specify whether you are chiefly interested in Bronze, Iron, Cast Steel or Corrosion-Resistant Valves.



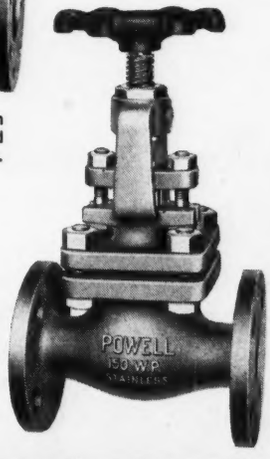
200-pound Stainless Steel Swing Check Valve.



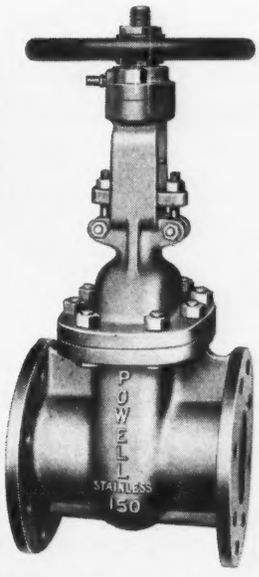
Large 125-pound Iron Body Bronze Mounted O. S. & Y. Globe Valve.



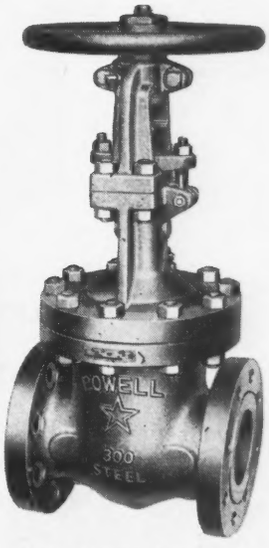
Large 125-pound Iron Body Bronze Mounted O. S. & Y. Gate Valve.



150 - pound Stainless Steel O. S. & Y. Gate Valve. Globe, Angle, and "Y" Valves also available in this pattern.



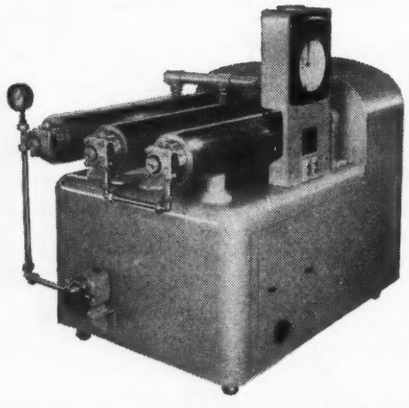
New Standard 150-pound Stainless Steel O. S. & Y. Gate Valve.



Class 300-pound Cast Steel O. S. & Y. Gate Valve.

POWELL VALVES

Starch Paste
Vegetable Shortening
Fruit Puree
Margarine
Concentrated Cream
Lard
Liquid Whole Eggs



The Continuous, Closed Votator Apparatus Processes Faster and Better

If your food product is processed in a viscous state and requires heat transfer, find out about the VOTATOR processing apparatus. This modern, sanitary, completely self-contained system has broken all records for processing efficiency and economy wherever it has been applied. Write to The Girdler Corporation, Votator Division, Louisville 1, Kentucky.

THE Votator A GIRDLER PRODUCT

DISTRICT OFFICES
150 Broadway, New York City 7
2612 Russ Bldg., San Francisco 4
617 Johnston Bldg., Charlotte 2, N. C.

VOTATOR—*T.M. Reg. U.S. Pat. Off.*

tor in a country where regular milk production is poor and purchasing power extremely low.

The Institute already has offered to assist in the establishment of processing plants, recommending that soya bean imports be increased pending expansion of acreage planted to the crop.

Freezer Manufacturers Show Postwar Products

THE fourth all-industry exposition of the Refrigeration Equipment Manufacturers Association, at Cleveland, in late October, brought the industry to a new starting point after the war interrupted years. Visitors, estimated at over 40,000 saw new and improved machinery that required more than three times the space utilized in previous years.

New freezers on hand included one by Carrier, on which a new series of reciprocating compressors were demonstrated. York also exhibited an improved freezer, while a milk-bottle size compressor by Jack & Heintz drew a great deal of attention. Two refrigerated truck trailers that attracted interest were the all-aluminum product of Dorsey Trailers, and a stainless steel trailer, manufactured by Fruehauf.

H. F. Spoehrer, president of the association, announced that Cleveland had again been selected for the next exposition, in January, 1948.

DISTRIBUTION

Test Tomato Shipments In Coop Reefer Run

GREEN tomato shipments were tested in a special refrigerator car experimental shipment at the end of October, the tenth of a series of test runs conducted jointly, in 1946, by the USDA and the Association of American Railroads. The run, from Tracy and Sacramento, Calif. to Jersey City, N. J., involved eleven different types of refrigerator cars, and was made in conjunction with three refrigerator car companies. Its purpose was to establish the kind and degree of ventilation that will keep tomatoes green or with only a touch of redness until unloaded at destination. It is preferable for ripening to take place on the dealers' stands.

This latest test is a further indication of increasing USDA activity in the sphere of distribution. It also emphasizes the increasing attention being paid to fresh fruits and vegetables, which, if available

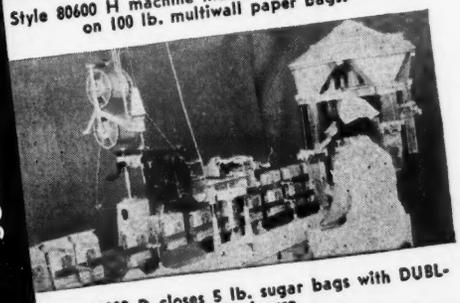
BEANS?

Style 60000 D sewing head trims tops and closes paper bags with Union Special's exclusive DUBL-TAPE closure.

STARCH?

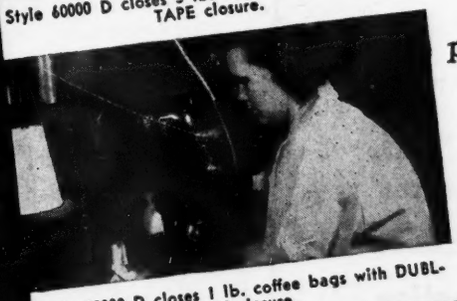
Style 80600 H machine makes tape bound closure on 100 lb. multiwall paper bags.

SUGAR?



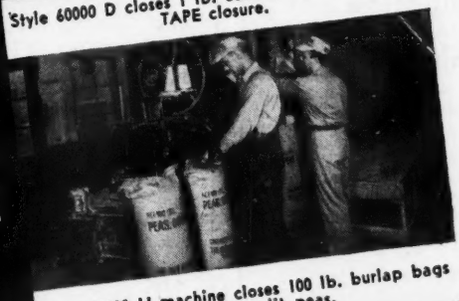
Style 60000 D closes 5 lb. sugar bags with DUBL-TAPE closure.

COFFEE?



Style 60000 D closes 1 lb. coffee bags with DUBL-TAPE closure.

PEAS?



Style 14500 H machine closes 100 lb. burlap bags containing split peas.

DOG FOOD?

Style 60000 D applies DUBL-TAPE closure to paper bags containing dog food.

What's your packaging problem?

If you want a simple . . . dependable . . . economical solution for your packaging problems, check with Union Special. For more than fifty years, Union Special has worked in close cooperation with makers of bags, conveyors, and bag filling and weighing equipment to produce specially designed bag closing machines that meet the needs of industry. Union Special equipment includes machines for closing bags of all types and sizes. Experience gained in handling bag closing problems in many different fields is your assurance of complete satisfaction. Ask for recommendations on your particular problems. Literature on request.

UNION SPECIAL MACHINE CO.
450 N. Franklin St., Chicago, Ill.

Union Special
Bag Closing Machines

Economy in packaging

. . . calls for protection against loss by leakage, or contamination by outside contacts.

INLAND STEEL CONTAINERS

. . . have the strength and tightness for safely packaging the thinnest liquids or penetrating products. Losses and product contamination are eliminated.

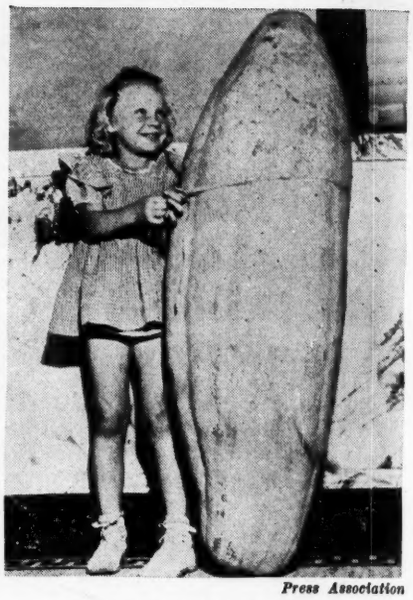
Steel drums and pails capacities 3 gal. to 55 gal.

INLAND STEEL CONTAINER CO.

Container Specialists

6532 S. MENARD AVENUE., CHICAGO 38, ILLINOIS

Plants at: Chicago • Jersey City • New Orleans



Press Association

CALIFORNIA SQUASH

This squash looks like something dreamed up by a California chamber of commerce. They go so far as to admit it is one of the largest ever grown in the state. Weighing 112 lb., the squash was 53 in. long.

in improved condition, or in larger quantities, will continue in active competition with processed foods.

No ice was used in the test cars, which were of the standard ventilated and controlled ventilated types. End bunker cars, overhead bunker cars and fan-equipped cars were used. The tests were impaired, however, by unseasonably warm weather along the route, which resulted in more ripening than would have taken place under normal conditions.

It is planned to repeat this test next season, when USDA officials believe that, with suitable ventilation, they can maintain the 60 to 70 deg. F. range resulting in 25 percent ripening preferred by consignees.

Canned Food Stocks Near Prewar Levels

FOR the first time since prewar years, canners must answer the question how much of my 1947 pack can I sell and how much will I be forced to carry over.

Stocks of canned goods in retail channels have approached prewar figures, according to the September 1 figures of the Department of Commerce. This is a general picture since detailed investigation reveals some items have not recovered from the drain of the war years, tomatoes being a good example. On the other hand, a few items are in heavy supply, such as peas.

"The canning industry packed

"I thought that truth in advertising was a lost art," a plant superintendent wrote us recently, "until I was convinced otherwise by one of your Diversey D-Men. The work done in our plant by him has been extremely valuable He's our man from now on!"

The particular advertisement referred to simply said that a Diversey D-Man is much more than merely a salesman. He's a trained specialist in food plant sanitation. One of the most important parts of his job is to come into your plant, decked out in overalls and ready for work. And he'll stay there, be it a few hours or several days, until he has fully instructed your plant men in the proper use of the Diversey products recommended, or licked the problem confronting you.

Yes, that is what our advertising has promised, and that is what the Diversey D-Man will deliver. Why not give him a chance at a problem in *your* plant . . . as many others already have? You have nothing to lose . . . not *even* your time . . . because in the field of sanitation, Diversey alone offers this kind of "shirt-sleeves" and "overalls" service backed by a staff of trained experts. It gets results! The Diversey Corporation, 53 W. Jackson Blvd., Chicago 4, Ill.

DIVERSEY

Complete Sanitation Service

FOR THE MODERN FOOD PLANT

DIVERSEY PRODUCTS FOR THE FOOD PLANT

Diversol—A quick-acting bactericide combining sodium hypochlorite and alkaline sodium phosphate in crystal form. Disinfects without corroding equipment.

D-Luxe—The ideal product for daily hand or machine cleaning of equipment.

Divoluxe—A new cleaner desirable for hard water areas.

Rellon—A triple-action compound that assures clean, sparkling bottles.

Mirrolite—For bottle washing in hard water areas.

Heavy Duty—Cleans copper vacuum pans.

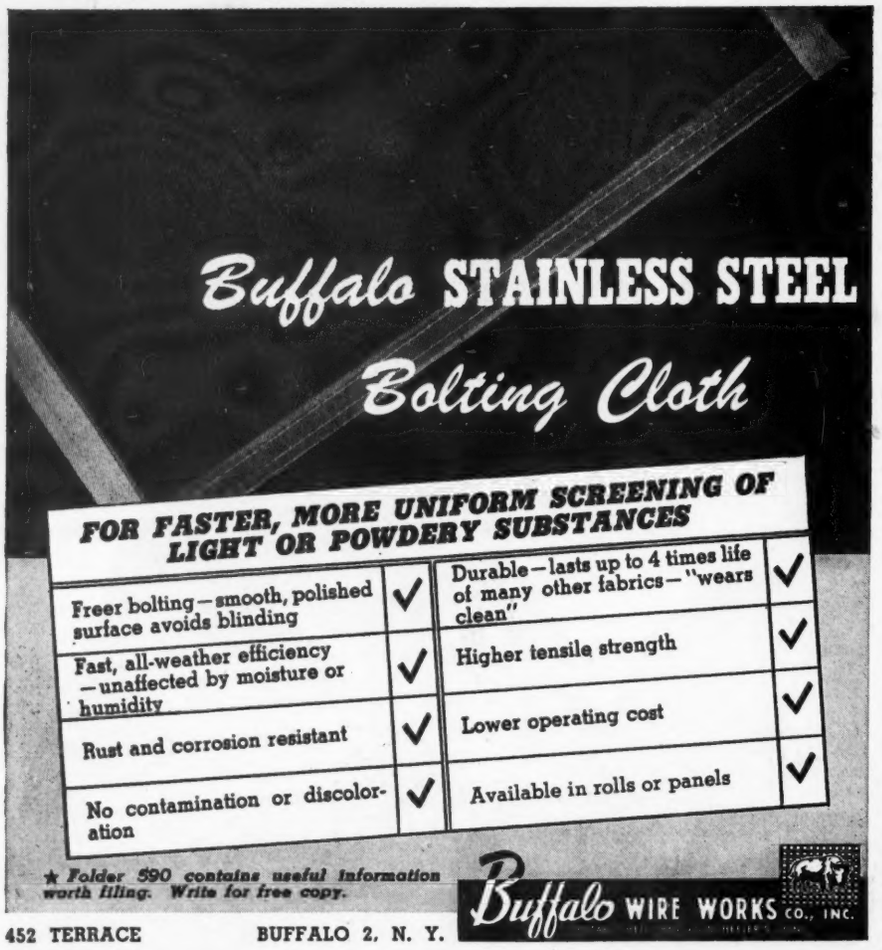
Everite—For removing scale and encrustations from bottle and can washing machines, vat coils, condensers, and other equipment.

Novex—Delivers clean, sweet-smelling cans at low cost.

Canrite—Removes milkstone from cans quickly and safely by machine washing.

Dilac—Removes milkstone from plate-type pasteurizers.

Dicoloid—Used in paste-form to remove milkstone.


Buffalo STAINLESS STEEL
Bolting Cloth
FOR FASTER, MORE UNIFORM SCREENING OF LIGHT OR POWDERY SUBSTANCES
Freer bolting—smooth, polished surface avoids blinding
Fast, all-weather efficiency—unaffected by moisture or humidity
Rust and corrosion resistant
No contamination or discoloration
Durable—lasts up to 4 times life of many other fabrics—"wears clean"
Higher tensile strength
Lower operating cost
Available in rolls or panels
★ Folder 590 contains useful information worth filing. Write for free copy.
Buffalo WIRE WORKS CO., INC.
452 TERRACE BUFFALO 2, N. Y.

NATIONAL AIROIL FUEL OIL · GAS BURNERS
TYPE "SA" OIL BURNER
STEAM
OIL
operates continuously without cleaning or clogging . . .
requires minimum supervision and maintenance. With internal atomizing feature (using steam or compressed air for atomization) the Type "SA" Oil Burner completely atomizes and thoroughly burns the lowest and cheapest grades of fuel oil and tar, requires only low oil pressure and temperature.
Type "SA" Oil Burner, generating steam for heating, power or process, is equally adaptable to installation in boilers, stills, dryers, large capacity cookers and other types of industrial furnaces.
Write for Bulletin 21, it tells the complete story.
NATIONAL AIROIL BURNER CO., INC.
Main Offices & Factory: 1272 EAST SEDGLEY AVENUE, PHILADELPHIA 34, PA.
Texas Office: 2nd National Bank Bldg., Houston

480,000,000 cases during the 12 month period, a record achievement —100,000,000 cases more than in the preceding 12 months." By this unprecedented production, the industry was able to rebuild inventories while making record shipments during the same period.

Prepackaging Summary Poses Some Questions

DEPARTMENT of Agriculture officials expect great advances in prepackaging of fruits and vegetables so that they will reach the housewife at "more uniform quality and greater convenience." But their summary of prepackaging recently issued poses some questions of importance.

"Although packaging in moisture-vapor-proof film helps in some respects to preserve freshness and avoid spoilage," says the summary, "it may also have adverse physical effects on the product unless great care is taken to adapt the packaging methods and materials, and handling practices, to the requirements of each item. Some costs of marketing are increased, and others decreased, by prepackaging, with the net effect not yet clearly determinable."

Sweeping Decontrols Leave Few WF Orders

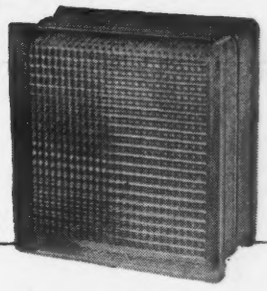
IN a preelection hysteria, the Department of Agriculture revoked nearly all War Food Orders. So precipitous was the action that department officials continued administering some orders for a day or two after the action had been taken because official notification had not been made within the department.

War Food Orders remaining in force in whole or in part as of November 7 are as follows: 2, butter, set aside; 7, sugar—controls distribution of raw sugar among refiners; 10, rice—controls distribution; 15, cheddar cheese, set aside (partially inactive); 16, dried fruit, set aside; 44, canned fish and shell fish, set aside; 51, edible molasses—controls distribution; 56, delegates authority to OPA with respect to food rationing; 57, rationing the territories of Hawaii and Alaska; 63, controls food imports; 64, sugar rationing; 66, controls use of malted grains; 68, delegates authority to ration food in Puerto Rico, Virgin Islands, and Panama Canal Zone; 71, provides for food priorities; 78, provides for the enforcement of priority regulations, controls distribution; 79, fluid milk and cream; 82, walnuts set aside; 130, controls

Cut operating costs
Improve operating conditions

with

PC GLASS BLOCKS



LARGE panels of PC Glass Blocks admit floods of diffused daylight. The light is distributed so widely as to increase useable floor space, frequently enabling more men, more machines, to turn out more goods in the same shop. Much less artificial light is needed, so lighting costs take a sharp drop.

Other savings are traceable to the *insulating* properties of PC Glass Blocks. The thick walls of glass and the dead air space inside the blocks prevent heat losses, minimize condensation in humid workrooms. The solid panels of glass blocks leave no cracks or joints to admit chilling drafts. So precision machines near light openings run at top speed and efficiency even in zero weather. And, of course, less fuel is needed, so heating costs hit new lows.

PC Glass Blocks seldom need maintenance or repairs. Their surfaces—being glass—are quickly and easily cleaned. PC Glass Blocks do not break readily or leave unsightly gaps as do broken panes. They eliminate the necessity for repairing and repainting window sash. All of these features add up to *important money-savings* over the years.

For your convenience we have recently assembled and published complete, authoritative data on the many and varied uses of PC Glass Blocks in building construction. Your free copy of our 28-page illustrated handbook is now ready. It contains engineering data, typical layouts and specifications, illustrations and lists of the full line of patterns and sizes—and a clear description of *function* of each type of PC Glass Block. Send for this free manual today.

Architect: Louis Wirsching, Jr.

ALSO MAKERS OF
PC FOAMGLAS INSULATION

PITTSBURGH
PC
CORNING

GLASS BLOCKS

Distributed by
PITTSBURGH PLATE GLASS COMPANY *and by W. P. Fuller & Co. on the Pacific Coast*

Pittsburgh Corning Corporation
Room 385, 632 Duquesne Way
Pittsburgh 22, Pa.

Please send along my free copy of your new book on the use of PC Glass Blocks for Industrial Buildings. It is understood that I incur no obligation.

Name_____

Address_____

City_____ State_____

Handling conditions vary for each particular plant. Your own problem should be presented to an experienced material handling engineer. However, the following example outlines a simple method for determining the savings possible with an electric industrial truck. Let us assume a hypothetical plant with the simple problem of transporting daily 180 tons of material 200 feet from stockrooms to processing machines. Without power trucks this would require 10 truckers, each making 10 round trips per hour, or 80 trips per day, carrying 450 lbs. of material per load.

COST OF MATERIAL HANDLING

Per ton—based on 180 tons per day

In addition to these savings, Baker Trucks reduce warehouse rental charges by tiering, contribute to plant safety, speed production and material movement, and perform many other operations that reduce plant overhead.

TABLE I—*Handling Costs Without Electric Truck*

Based on 180 tons per day	*Cost per day*	*Cost per ton*
Labor (85¢ per hour)	$68.00	$0.378
Social Security Taxes	2.72	0.015
Workmen's Compensation	1.00	0.006
Hand Truck Depreciation	0.30	0.002
Total	$72.02	$0.401

In order to mechanize handling operations, the following equipment would be required:

TABLE II—*Cost of Equipment for Mechanizing*

Fork Lift Truck 2000-lb. capacity	$4,100.00
Battery	600.00
Charging Equipment	840.00
200 pallets	700.00
Total	$6,240.00

The truck, handling one-ton pallet loads of material, making 24 round trips per hour, could transport the 180 tons in 7½ hours.

TABLE III—*Annual Expense—Truck Operation*

Depreciation—Truck at 10%	$410.00
Battery at 20%	120.00
Charging equipment at 6⅔%	56.00
Pallets at 20%	140.00
Tires	100.00
Repair and Maintenance—Truck	164.00
Battery	24.00
Charging Equipment	33.60
Replacement of damaged pallets	70.00
Electricity	82.00
Insurance	10.00
Total annual expense	$1,209.60
Expense per day	4.03

TABLE IV—*Handling Costs—With Electric Truck*

Based on 180 tons per day	*Cost per day*	*Cost per ton*
Labor (Driver—$1 per hour)	$8.00	$0.044
Social Security Taxes	0.32	0.002
Workmen's Compensation	0.16	0.001
Truck Expense	4.03	0.022
Total	$12.51	$0.069

TABLE V—*Savings With Electric Truck*

Savings Per Ton	$ 0.332
Savings Per Day (Handling 180 tons)	59.51
Savings Per Year (300 days)	17,853.00
Per Cent Reduction in handling costs	83%
Annual earnings on investment	286%

While this example is obviously oversimplified, Baker Material Handling Engineers are prepared to show you how similar savings can be made on handling operations in your plant.

BAKER INDUSTRIAL TRUCK DIVISION *of The Baker-Raulang Company*
2146 WEST 25TH STREET • CLEVELAND, OHIO
In Canada: Railway and Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS

purchase, use and sale of the 1945 crop of peanuts some of which are still in hands of crushers; 131, controls distribution of direct consumption sugar; 135, provides for veterans preference for new farm machinery; 139, live stock and meats—provides for exemption from slaughtering limitations; 141, restricts use of grain for distilled products; 144, wheat and flour, controls use; 149, cream controls, distribution.

Few of these orders are widely important to food processors.

By November the whole government philosophy had turned over. The ideas on food that Congress wrote into the extension of the price control law were adopted by OPA for the rest of the economy. Before that time, everything was under control except items listed. After that time, only the listed items were under control.

World food production for the 1946-47 year was estimated by the U. S. Department of Agriculture at 7 percent above the previous year's low output. By maintaining the high level of output of the war years, the United States and Canada were credited with the greatest contribution to the world supply. Another report of the U. S. Department of Agriculture on wheat stocks as of October 1 showed a decline in the quantity of wheat stored in all positions. Because of the low carryover, the bumper wheat crop just harvested was not enough to increase the available supplies.

Dry Foods Discarded As Solution In India

FURTHER evidence that use of dehydrated foods to alleviate India's famine conditions is a failure is seen in the decision of the Bombay Provincial Government not to renew vegetable orders when present stocks are exhausted.

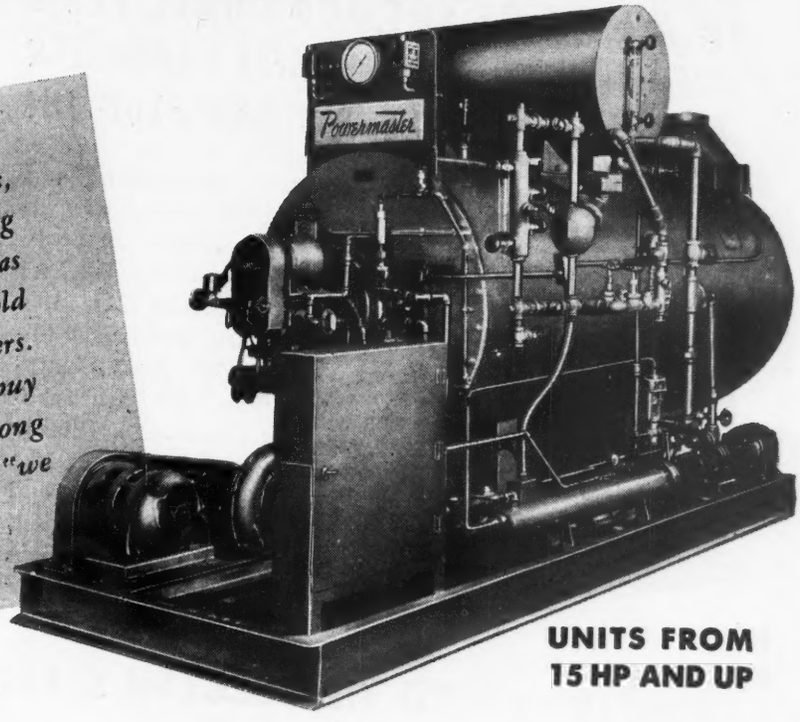
Eating habits and price have been the two determining factors. Rice and cereals are the mainstays of the diet of the average low-income Indian family. And the cost of the dry products was too high for the worker's slim funds.

Early this year Bombay purchased from the U. S. 1,000 tons of dehydrated potatoes, 50 tons of turnips and 50 tons of cabbage. Despite the shortages here none of the stocks have been exhausted even though customs duties were waived by the Central Government, and the Provincial Government subsidized the sales to push the retail potato prices down to about 36 cents a lb.

Similar experiences in other

"We always get plenty of Steam from our *Powermaster* -and save fuel too"

Hundreds of canners, meat packers, dairies, bottlers, etc. are getting ample steam automatically—in as little as 18 minutes from a cold start through their Powermasters. "Dependable, low-cost unit to buy and operate," reports a Long Branch, N. J. dairy owner, "we save 20% in fuel alone."



UNITS FROM 15 HP AND UP

Wherever you go the story's the same—enthusiastic testimonials to the speed, efficiency and economy of the Orr & Sembower Powermaster Steam Generator.

Equipped for both light and heavy oil firing, the Powermaster Unit operates at thermal efficiencies of approximately 80%, maintained in everyday use.

Being fully automatic, it eliminates the need for time-consuming preparation and constant attention to valves, gauges and controls. A flick of the switch starts and stops the Powermaster with minimum manual attention.

Its forced draft feature, efficient arrangement of heating surface and compact design combine to save valuable plant space. And because the Powermaster is assembled on a steel base, pre-tested at the factory and delivered in one complete unit, installation is quick and easy—accomplished with practically no interruption to your plant operation.

The O&S Powermaster Steam Generating Unit is backed by 61 years of boiler design and manufacture. You will find thousands of O&S users throughout U. S. and the World who get dependable steam at low cost in everyday operation.

It's all in the Engineering! Boiler, oil-burner, condensate return and automatic control systems are combined in one "packaged" unit tested to A. S. M. E. standards. Find out how to save installation, maintenance and operating costs with the Powermaster. Mail Coupon below for O&S Bulletin #1214.

ORR & SEMBOWER INC.

READING, PENNSYLVANIA

District Offices: BOSTON - CHICAGO - CLEVELAND - NEW YORK - PHILADELPHIA - SEATTLE

ORR & SEMBOWER, INC.
812 MORGANTOWN ROAD
READING, PENNSYLVANIA

Please mail the new 8-page O & S Powermaster Bulletin #1214, without obligation, to:

COMPANY_____

ADDRESS_____

CITY_____ ZONE #_____ STATE_____

ATTENTION OF_____

DEATH TO FLIES*

IN AREAS OF 500,000 CUBIC FEET! THE NEW WEST HYDRO-MIST VAPORIZER AUTOMATIC — JUST FILL AND PLUG IN!

A new, outstanding and completely automatic insecticide sprayer. Simple to operate—merely fill, set time clock, and plug in to AC or DC outlet. One filling of the West Hydro-Mist Vaporizer with Vaposector Fluid will efficiently control roaches in an area up to 50,000 cubic feet, and achieve a POSITIVE KILL of flying insects in areas of 500,000 cubic feet!

CONCENTRATED VAPOSECTOR FLUID

Amazingly Effective Insecticide for use in the West Hydro-Mist Vaporizer

VAPOSECTOR FLUID is a concentrated insecticide especially effective for use in Electric Sprayers. It has a high killing efficiency and is economical and highly effective against flies, roaches, mosquitoes, ants, fleas, crickets, spiders and many other insects. It will cause roaches to crawl out of their hiding places to be killed easily This insecticide is harmless to food and fabrics, when used according to directions

*Vaposector Insecticide when dispersed by the Hydro-Mist Vaporizer can achieve a positive kill of such flying insects as Flies, Gnats, and Mosquitoes in areas of 500,000 cubic feet!

ASK FOR A DEMONSTRATION

Seeing Is Believing!

or

Write for FREE Booklet

CLIP TO YOUR BUSINESS LETTERHEAD, PLEASE

WEST DISINFECTING Company 42-16 WEST ST., L. I. CITY 1, N. Y., DEPT. F

We are interested in a demonstration of the West HYDRO-MIST VAPORIZER. ☐

Please Send Me Your Booklet ☐

Name_____ Position_____

parts of India have caused the Central Government to drop earlier plans for purchasing large quantities of dehydrated vegetables and eggs from Australia, a decision which is reported to have brought the closing of many dehydrating plants there.

Tea Order Terminated

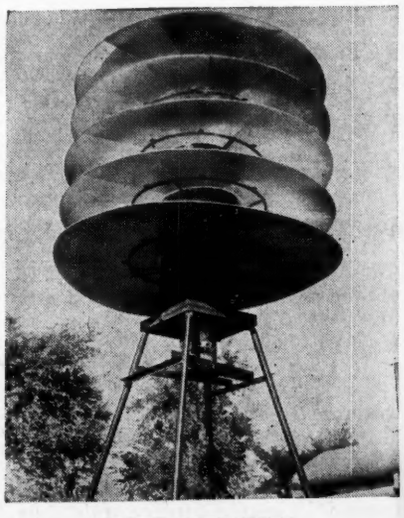
THE Department of Agriculture, on October 30, terminated War Food Order 21, which was issued February 13, 1943, to facilitate equitable distribution of the available supply of tea during the war emergency period.

With this termination of WFO 21, the importation of tea is returned to the tea industry and will be regulated only through import controls, according to the department. All tea purchased by the government under this order has now been allocated.

Decontrol Brings More Medium Priced Candy

AMERICAN candy consumers may expect to find a greater variety of medium-priced bulk candies on the market in the near future, as a result of decontrol of confectionery prices by OPA, declared John Rote, Cambridge, Mass., chairman of a special committee of the National Confectioners Association.

Quantity, of course, will still be limited by the sugar shortage, Mr. Rote pointed out, but manufactur-



FIELD DEFROSTER

Scientists at Michigan State College have developed this formidable looking device as an answer to costly frost damage to fruits and vegetables. An oil burning heater sends out infrared heat rays that keep the plants, in its area, 8 deg. warmer than the prevailing temperature. Engineers believe that a practical farm unit, large enough to protect an acre, can be built for less than $100, while units covering two or three acres would run somewhat higher.

WHAT? WHERE? WHEN? WHY?

What's new in the canning and freezing industries? What are those amazing advancements made in flash pasteurizing—cooking—cooling—glass handling? What improvements have been made in labeling, boxing, handling in warehouse? What's really new in equipment and supplies for your plant? How about deliveries? Answers to these and countless other questions will be supplied at the Canners' Convention and Exhibit. Now, more than ever before in our history it's vital that every canner—every production man acquaint himself thoroughly with the latest labor-saving, quality-insuring equipment and supplies.

Plan **NOW** *to attend*

40 YEARS OF CANNING PROGRESS

CANNERS' CONVENTION

JANUARY 19-24, 1947 · CONVENTION HALL
ATLANTIC CITY, N. J.

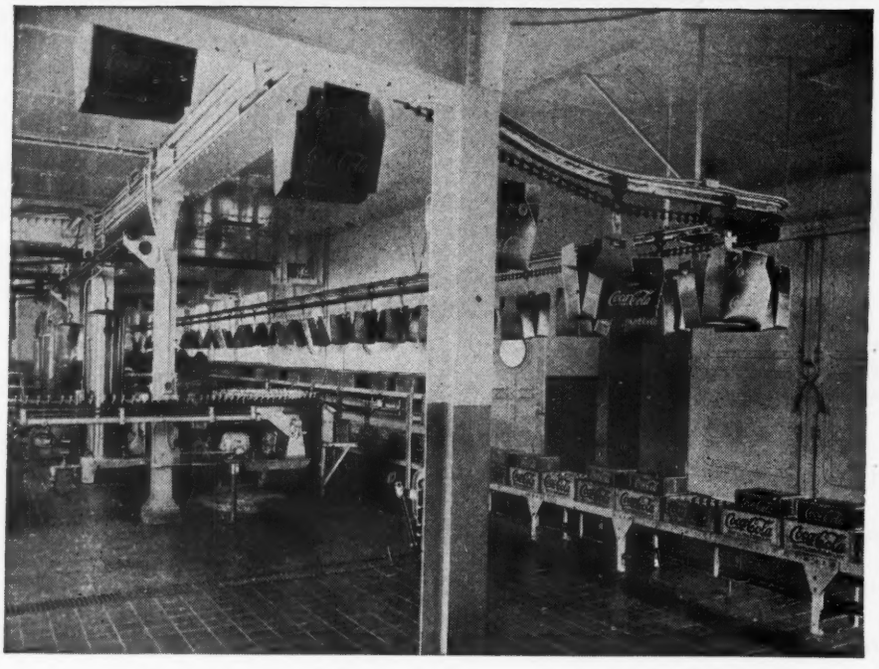
CANNING MACHINERY AND SUPPLIES ASSOCIATION

BATTLE CREEK, MICHIGAN

Mathews

TROLLEY CONVEYERS

Engineered to serve Production



Trolley Conveyers are especially practical in busy, crowded plants where floor space is at a premium and the more common floor types of conveyer cannot be applied without sacrificing this much needed floor space. Trolley Conveyers, by means of transverse bends dipped down to working height at pre-determined points in the plant, can keep materials flowing steadily at a controlled speed. A variety of types of hooks and hangers add to the flexibility of Trolley Conveyer systems. There is a Mathews Engineer operating in your vicinity. He will be glad to have an opportunity to tell you about Trolley Conveyers, and about the many other types of Mathews Conveyers which have been engineered to serve production. Your inquiry involves no obligation. Write or wire for engineering service.

MATHEWS CONVEYER COMPANY
ELLWOOD CITY, PENNSYLVANIA
SAN FRANCISCO, CAL. • PORT HOPE, ONT.
ENGINEERING OFFICES IN PRINCIPAL CITIES

ers, who abandoned lower-priced lines because OPA ceilings made the business unprofitable, will now resume production of these candies which will return to the market at prices higher than the 1942 frozen prices but at lower prices than candy now on sale incorporating more expensive ingredients. Easing of the sugar shortage, expected in latter part of 1947, will further encourage the return of confections of all types.

RAW MATERIALS

World's Fats and Oils Short by 50 Percent

INTERNATIONAL Emergency Food Council recommended at the end of October specific allocation of fats, oils, and oil-bearing materials for the calendar year 1946. Previously only interim recommendations have been made to facilitate shipping arrangements and provide for urgent current needs.

World import requirements submitted to IEFC totaled about 5,000,000 tons. Supplies available for world export to meet these requirements totaled between 50 and 55 percent of that figure. In the statement of the council which was made public it was indicated that the final allocation was not unanimously regarded as the most equitable.

Sugar Study Report Forecasts Increases

INDUSTRIAL and institutional users of sugar will get about 27 percent more in 1947 than they received this year, according to the sugar committee of the Food Industry Council, in a report from its objective study of how to increase sugar supplies in the U. S.

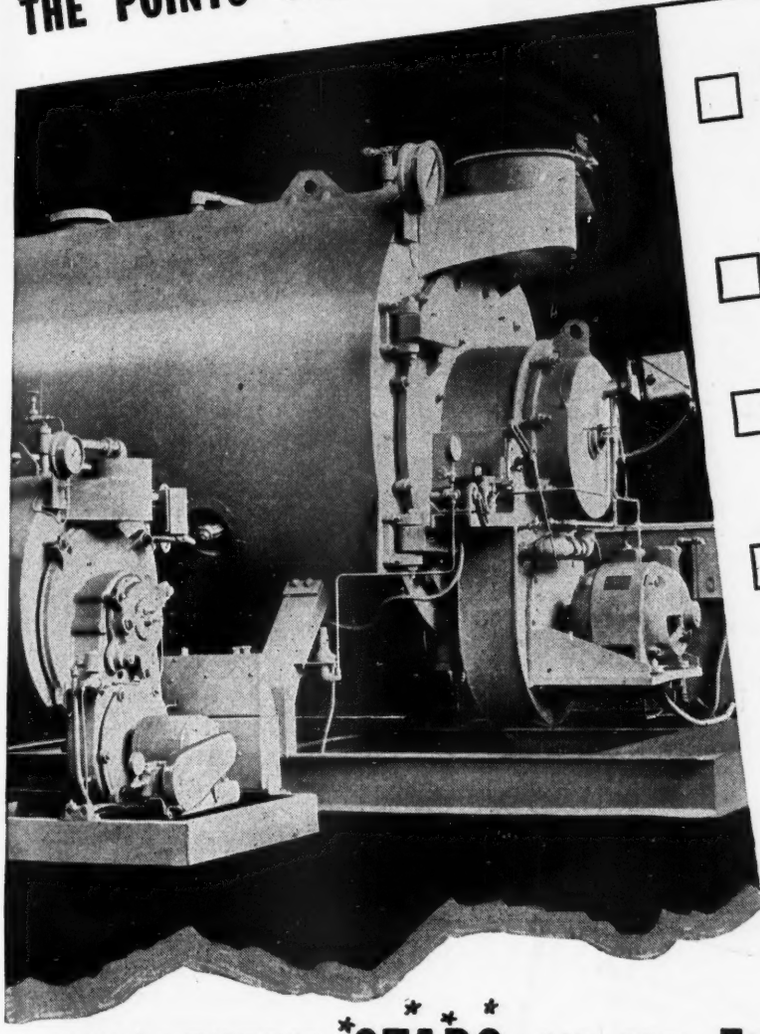
The committee urges that decontrol be gradual in order to prevent a repetition of the chaotic conditions that followed World War I, when the price rose to 21.55 cents per lb. in July, 1920 only to fall to 4.80 cents in January, 1922. The report adds that no firm commitments to foreign countries should be made at this time with reference to allocations of the 1947 supplies. If it is necessary to make interim or emergency allocations, they should be for minimum amounts only.

The analysis, which was begun in July, reflects an impartial and objective study of the world supply of sugar, world requirements and the present position in which the U. S. finds itself.

When you pick a STEAM generator

Check Value!

THE POINTS THAT MEASURE



☐ **SIMPLIFIED DESIGN**
Cyclotherm's exclusive combustion method permits simplified overall design and 2 pass boiler construction. Burner and boiler engineered as an integral unit.

☐ **PERFORMANCE**
Cyclotherm provides steam automatically as you need it. Overall thermal efficiency will be not less than 80%.

☐ **ECONOMY OF OPERATION**
Cyclotherm units may be fired with any liquid or gaseous fuel with maximum efficiency. Automatic modulation of flame on units 50 HP and up.

☐ **LOW UPKEEP**
Unique combustion principle with 2 pass boiler assures longer life, fewer and easier inspections and "clean-outs".

☐ **INITIAL COST**
Cyclotherm units are low in cost; easy and inexpensive to install. Delivered ready to produce steam; require no special foundation.

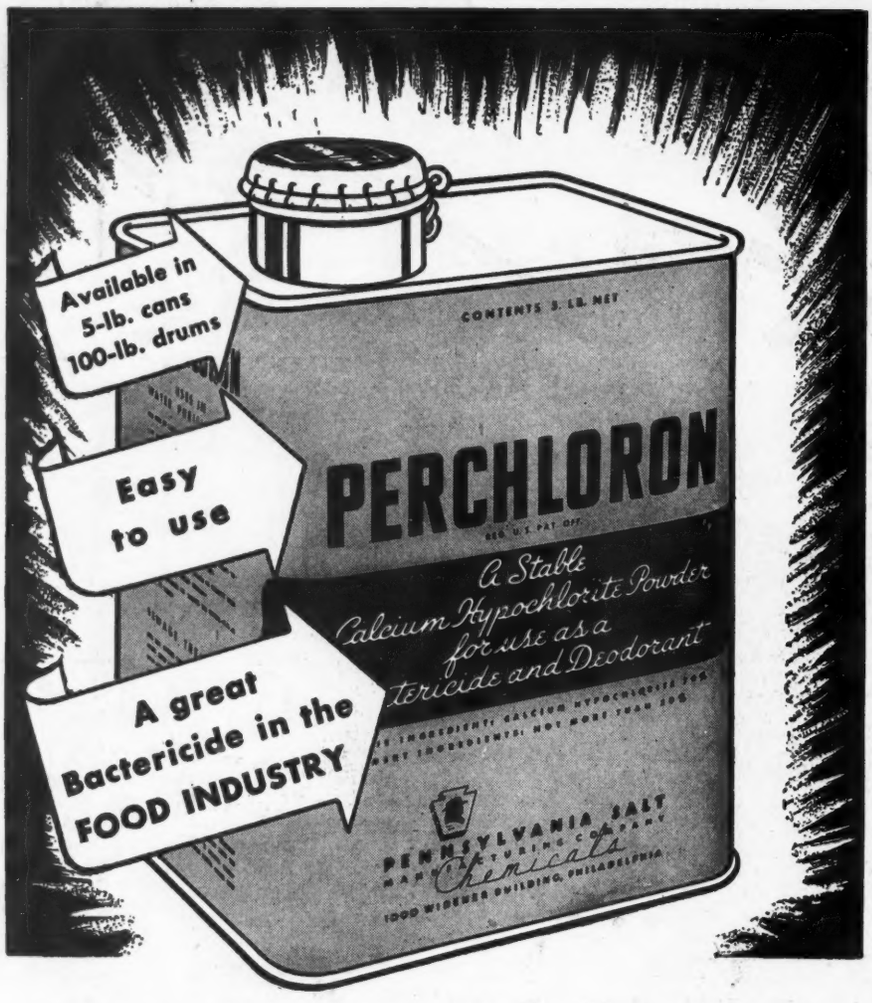
CYCLOTHERM STARS ON ALL 5 COUNTS

IT'S YOUR BEST BUY!

Wire, write or phone for more information

CYCLOTHERM STEAM GENERATORS

CYCLOTHERM CORPORATION, 90 BROAD STREET, BOX 501. NEW YORK 4, N. Y.


Available in 5-lb. cans 100-lb. drums
Easy to use
A great Bactericide in the FOOD INDUSTRY
CONTENTS 5 LB. NET
PERCHLORON
A Stable Calcium Hypochlorite Powder for use as a Bactericide and Deodorant
PENNSYLVANIA SALT MANUFACTURING COMPANY
Chemicals
1000 WIDENER BUILDING, PHILADELPHIA

PERCHLORON is a desirable source of chlorine, quick acting and not injurious to metals, at recommended concentrations. Perchloron will not impart odors or flavors to food products which contact sterilized utensils.

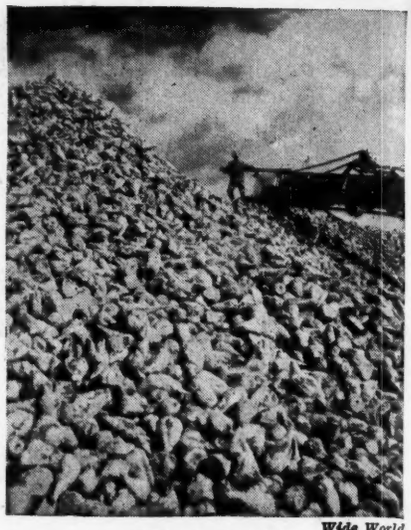
AS A BACTERICIDE, PERCHLORON IS USED IN:

- Milk separators and ice cream freezers
- Cream and cheese factory utensils
- Preserving, baking and candy-making utensils
- Bottle washing equipment
- Cannery equipment
- Tanks and tank cars
- Tables, shelves and floors

Other Penn Salt Products for the Food Industry

B-K Bactericide
G M Kleanser
Anhydrous Ammonia
DDT Insecticides

PENNSYLVANIA SALT MANUFACTURING COMPANY
Chemicals
1000 WIDENER BUILDING, PHILADELPHIA 7, PA.
New York • Chicago • St. Louis • Pittsburgh • Cincinnati • Minneapolis • Wyandotte • Tacoma



Wide World

SUGAR BEETS

This mountain should be a welcome sight to sugar users. It is part of a sugar beet dump, near Brownstown, Wash. Farmers in the region are preparing a record harvest that is expected to yield more than 90,000,000 lb. of sugar from close to 325,000 tons of beets.

Edwin O. Blomquist, vice-president of E. J. Brach & Sons, Chicago, is chairman of the Sugar Committee. Its other members are: Talbot O. Freeman, vice-president, Pepsi-Cola Company, New York City; Ridgway Kennedy, Jr., vice-president, Abbott's Dairies, Inc., Philadelphia; and Ralph D. Ward, president, Drake Bakeries, Brooklyn, N. Y. Clarence Francis, chairman of the Board of General Foods Corporation, New York, is chairman of the Food Industry Council.

New Farm Goals Call For Full Production

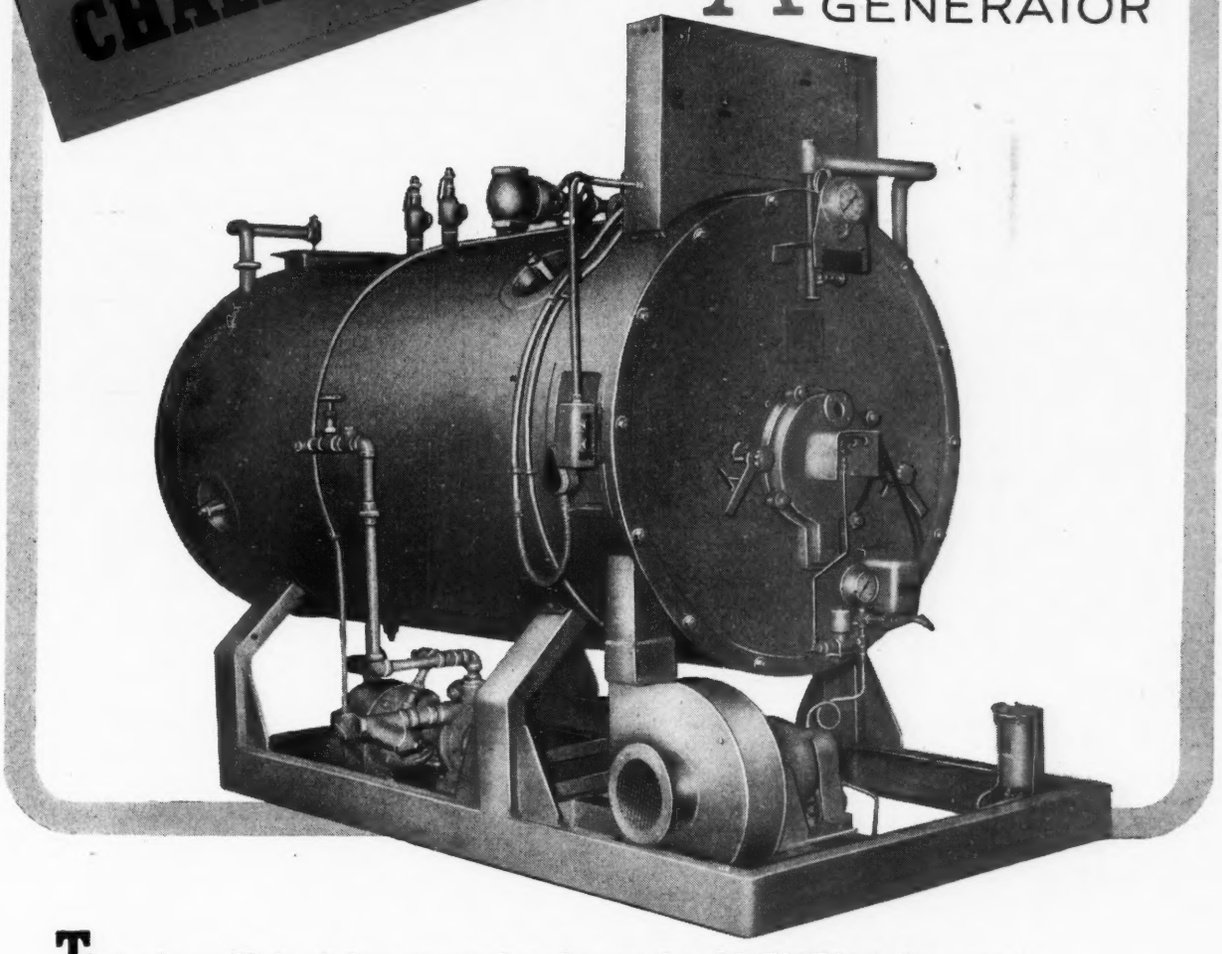
FARM goals for 1947 call for a continuation of all out farm production if the recommendations of the Department of Agriculture are to be met. The goals taken state by state may vary considerably from last year's targets as adjustments are made by state officials.

Emphasis is on the production of greater quantities of vegetable oils, cotton, dry beans, barley and grain sorghums. A 9 percent decline in acreage is suggested for truck crops for processing, which the Department of Agriculture announced as merely a guide "to secure a more balanced use of truck crop acreage." Actually, the proposals for 1947 are only about 2,000,000 acres below the acreage farmers were asked to plant in 1946.

Livestock goals call for a rather sharp increase of 10 percent in the spring and 11 percent in the fall pig crops. A decline of 1 percent in the

A CHALLENGE

THE AMESTEAM GENERATOR



There is no Unit giving as much value as the AMESTEAM Generator.

Satisfy yourself by examining its "on the job performance" and investigate our methods of design and fabrication, they are all backed by our 100 years experience in boiler design and construction.

The AMESTEAM Generator is guaranteed to operate at 80% efficiency under day by day operating conditions in your plant, when using any standard grade of fuel oil or gas.

We have a Unit to meet your most exacting requirements. Standard sizes are from 10 to 300 H.P. and pressures from 15 lbs. to 200 lbs. Write, wire, or phone for further details, giving us your requirements.

A complete return-to-the-boiler system, including Feed Water Pump and Condensate Tank with their accessories, is part of the standard equipment with every standard AMESTEAM Generator.

AMES IRON WORKS

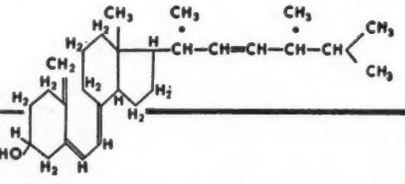
BOX A12 OSWEGO, NEW YORK

YOU SHOULD ADOPT

Calciferol

(PURE CRYSTALLINE VITAMIN D_2)

Calciferol is the name applicable *only to the superior, pure crystalline product* as so recognized and used throughout the world.



WRITE FOR DETAILS AND NEW LOW PRICE SCHEDULE

Winthrop's pure crystalline synthetic vitamin D_2 (Calciferol) is free from lumisterol, toxisterol, suprasterol, and other by-products of irradiation. It never varies in antirachitic potency.

OTHER WINTHROP PURE SYNTHETIC VITAMINS:

- **TRIDEE**—Winthrop's Brand of vitamin D_3 in Corn Oil
- **VITAMIN B_1** (Thiamine Hydrochloride)
- **VITAMIN B_2** (Riboflavin)
- **NIACINAMIDE**
- **VITAMIN B_6** (Pyridoxine Hydrochloride)
- **CALCIUM PANTOTHENATE**
- **VITAMIN C** (Ascorbic Acid)
- **AMINO-ACIDS**

Valine	Glutamic Acid
Cystine	Tryptophane
Tyrosine	Phenylalanine
Leucine	Methionine

- **"B-E-T-S"**—Winthrop's Brand of Bread-Enrichment Tablets
- **"VEXTRAM"**—Winthrop's Brand of Flour-Enrichment Mixture

POTENCIES AND PACKINGS:

Crystalline Form in vials of one, five, and ten grams.

Solution in Corn Oil: 1,000,000 U.S.P. Units per gram* packed as follows:

400 Standard Units	2,500 Standard Units
1,000 Standard Units	50,000 Standard Units

Also Solution in Corn Oil: 400,000 U.S.P. Units per gram packed as follows:

250 Standard Units	1,000 Standard Units
500 Standard Units	20,000 Standard Units

*Standard Unit=1,000,000 U.S.P. Units

WINTHROP

For prices and information address
Special Markets Division
WINTHROP CHEMICAL COMPANY, INC.
170 Varick Street, New York 13, N. Y.

number of dairy cows on the farms has been suggested. For beef cattle, the goal is 3 percent lower than this year, but still 144 percent above the five year prewar average. The only sharp cut recommended is in egg production and in numbers of hens.

Spice Allocations

THE International Emergency Food Council, acting on a recommendation approved by its committee on cocoa and spices at a meeting held in London on October 11, has decided to discontinue allocation recommmendations of Indian pepper and West Indian mace and nutmegs, which had been in operation up to September 30. The result of this decision is that no spices now remain under such recommendations.

SCHEDULE OF EVENTS

December

4-6—Georgia Canners Association, annual convention, Hotel De Soto, Savannah, Ga.
4-6—National Association of Manufacturers, 51st annual congress of American Industry, Waldorf-Astoria, New York.
4-5—Tri-State Packers Association, fall meeting, Benjamin Franklin Hotel, Philadelphia.
10-11—Ohio Canners Association, annual meeting, Deshler-Wallick Hotel, Columbus.
11—Minnesota Canners Association, 40th annual convention, Raddison Hotel, Minneapolis, Minn.
16-18—American Society of Refrigerating Engineers, 42nd annual meeting, Pennsylvania Hotel, New York.
16-21—Ice Cream Machinery and Supply Men's Dairy Equipment and Supply Short Course, Penn State College, State College, Pa.

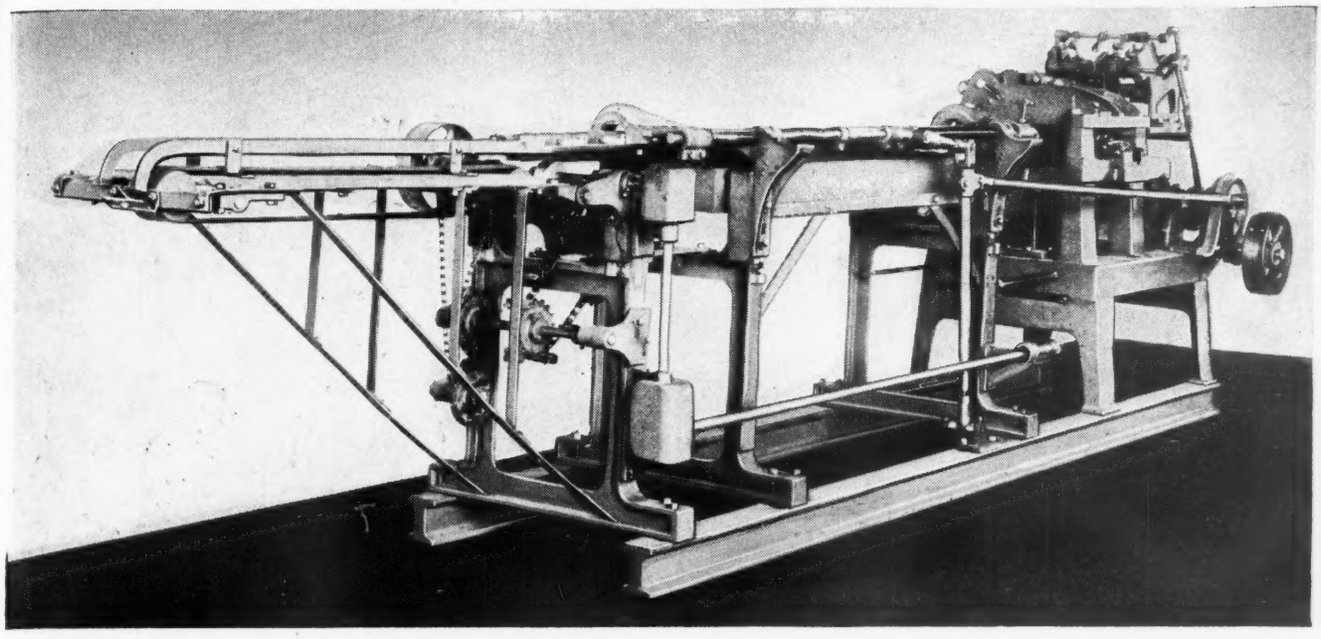
January

12-17—National Food Brokers Association, Atlantic City, N. J.
13-14—Refrigeration Research Foundation, annual meeting, Hotel Statler, Cleveland, Ohio.
16-17—National Pickle Packers Association, annual meeting, Palmer House, Chicago.
19-24—Canning Machinery and Supplies Association, 40th meeting and exhibit, Auditorium, Atlantic City, N. J.
19-24—National Canners Association, 40th annual convention, Atlantic City, N. J.
20-23—National American Wholesale Grocers Association, annual convention, Atlantic City, N. J.
20-Feb. 1—Ice Cream Manufacturers Short Course, Penn State College, State College, Pa.
27-29—National Potato Chip Institute, conference and annual election, Netherlands Plaza Hotel, Cincinnati.
27-31—American Society of Heating and Ventilating Engineers, 54th annual meeting and 7th International Exposition, Lakeside Hall, Cleveland, Ohio.
29-31—National Dairy Council, annual meeting and winter conference, Hotel Traymore, Atlantic City, N. J.
29-31—Indiana Canners and Fieldmen's School, 21st annual session, Purdue University, Lafayette, Ind.

February

2-4—American Poultry Industries, fact finding conference, Municipal Auditorium, Kansas City, Mo.
18-20—Michigan State College, technical school for pickle and kraut packers, East Lansing, Mich.
23-26—Associated Retail Bakers of America, national convention, Pennsylvania Hotel, New York.

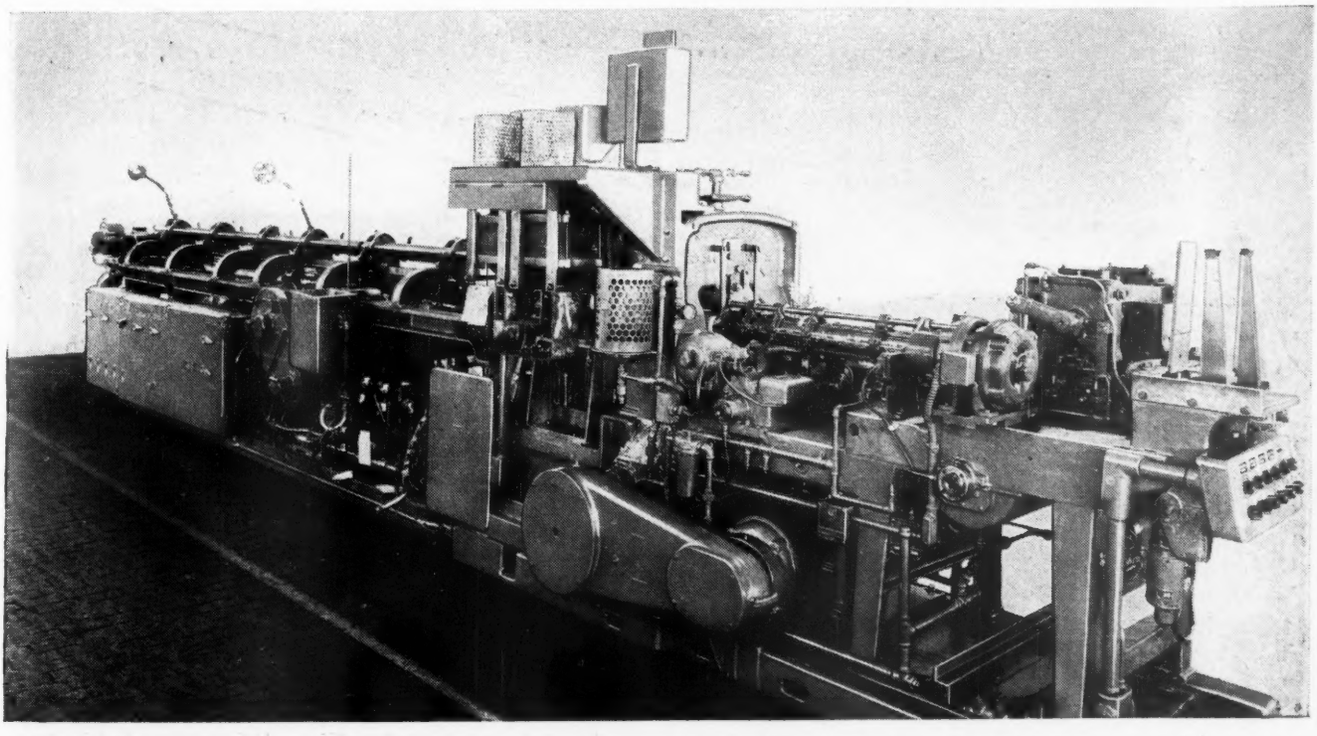
YOU'RE FASTER . . . WE'RE FASTER!



In 1904, this old-type can-making machine was a nine days' wonder . . . the last word in container production.

Geared to the nation's modest industrial requirements of that day (less than $42,000,000 worth of cans), it produced 75 containers a minute.

Nothing sensational by today's standards, but it did the job of supplying American industry with a round, metal package in limited quantity.



Today it's another story . . . *packaging* is a *must*—and the day of the open cracker barrel is almost a forgotten memory.

Packaging companies have accepted the challenge! (More than $400,000,000 worth of metal containers in 1945.) . . . Modern machines like this speed out 400 containers a minute. But more important . . . modern containers of all kinds MEET EXACT SPECIFICATIONS.

Now, consumer goods appear in metal and fiber packages in a multitude of sizes.

This year . . . as never before . . . the container-making industry is striving to supply the unprecedented demands of package-conscious America.

AMERICAN CAN COMPANY • NEW YORK • CHICAGO • SAN FRANCISCO CANCO **No other container protects like the can**

CASE HISTORY FACTS AND FIGURES PROVE ST. REGIS PACKAGING SYSTEMS BOOST PRODUCTION – CUT PACKAGING COSTS

FOOD — OUTPUT RISES 100%... COSTS DROP 77%

FERTILIZER — OUTPUT INCREASES 38%... COSTS DROP 26%

FEED — OUTPUT INCREASES 100%... COSTS DROP 55%

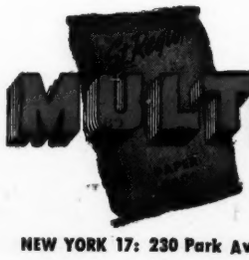
CHEMICALS — OUTPUT JUMPS 180%... COSTS DROP 24%

These results, reported in "Case History" studies in four major industries, demonstrate the efficiency and economy of St. Regis Packaging Systems (packers and multiwall paper valve bags). This modern packaging method is used for a wide range of products, with each system designed to meet specific product characteristics and plant layouts.

Manufacturers prefer St. Regis Packaging Systems because they cut labor costs and container costs . . . and increase packaging output at the same time. In addition, they have found that easy-to-handle paper bags have won wide acceptance with their customers.

Nearly 3,000 St. Regis valve bag filling machines are in operation throughout American industries. They are made in a variety of capacities and sizes. Filling speeds range from three to as high as twenty-four 100-lb. bags per minute — with only one operator required.

A St. Regis packaging engineer will be glad to discuss your packaging problems with you. For additional information call or write your nearest St. Regis office.



ST. REGIS SALES CORPORATION

(Sales Subsidiary of St. Regis Paper Company)

NEW YORK 17: 230 Park Ave. **CHICAGO 1: 230 No. Michigan Ave.**
BALTIMORE 2: 2601 O'Sullivan Bldg. **SAN FRANCISCO 4: 1 Montgomery St.**

Mail coupon for Free Folder describing each case in detail

Allentown Birmingham Boston Cleveland Dallas Denver Detroit Franklin, Va. Los Angeles Nazareth, Pa. New Orleans No. Kansas City, Mo. Ocala, Fla. Oswego, N. Y. Seattle Toledo

IN CANADA: St. Regis Paper Co. (Can.) Ltd., Montreal, Vancouver.

Read the facts and judge for yourself

Write for free copies of any case history, or for a complete set. They describe what was wrong with the "old system" and how a St. Regis Packaging System brought outstanding economies.

Case History	Product Packed	Increase in Packaging Output (Hourly)	Total Savings in Packaging Costs
No. 1	Flour Mix	100%	77%
No. 2	Fertilizer	20%	47%
No. 3	Poultry Grit	100%	55%
No. 4	Salt	18%	45%
No. 5	Cocoa	62%	60%
No. 6	Barley	—*	62%
No. 7	Dog Food	100%	34%
No. 8	Fuller's Earth	180%	24%
No. 9	Talc	100%	35%
No. 10	Fertilizer	38%	26%

*Previous figures not available

Without obligation please send me folders describing case histories indicated:

No. 1___ No. 2___ No. 3___ No. 4___ No. 5___
No. 6___ No. 7___ No. 8___ No. 9___ No. 10___

NAME_____

COMPANY_____

ADDRESS_____

Changes in Food Supplies

(Indicators)

Production

Flour production rose to 17,002,752 sacks, in October, in the Northwestern Miller's compilation covering approximately 71 percent of the mills. This was 1,877,659 sacks more than was produced in September, and 140,661 more than in October, 1945.

Citrus production for the 1945-46 season totaled 7,500,000 tons, a new record. Processing utilized 37 percent of the crop, the largest volume and the highest proportion of any citrus crop ever processed. Despite the larger crop, fresh sales totaled 6 percent less, on a tonnage basis, than in 1944-45.

Creamery butter production, in September, estimated at 104,695,000 lb., was larger than the output a year earlier for the first time since August, 1945. Although production was 22 percent below the five-year average for the month, it was 5 percent above September, 1945. The seasonal decline from August was only 10 percent, compared with a 15 per cent five-year average and a drop of 25 percent last year.

American cheese production, estimated at 70,655,000 lb., in September, represented a 13 percent drop from August, although it was 9 percent larger than the 1940-44 average, and close to the all time high of 71,009,000 lb. produced in September, 1945.

Ice cream production reached an estimated 63,410,000 gal., during September, a 12 percent increase over September, 1945 and 62 percent above the five-year September average. Production in the first nine months of this year totaled 602,100,000 gal., 70 percent above the same 1945 period and 83 percent above the five-year average.

The canned pea pack, for 1946, came to 40,933,000, on a 24/2's basis, according to the National Canners Association. This compares with 39,649,000 cases on the same basis, packed in 1945.

Red pitted cherries packed in 1946 came to 3,085,872 actual cases in the National Canners Association compilation. This more than doubled the 1945 pack of 1,300,490 actual cases and was slightly higher than the 3,071,940 cases packed in 1944.

The canned fish pack for the U. S. and Alaska was running 8 percent below last year, on September 30, amounting to 386,580,600 lb., compared with 421,592,700 lb. in 1945. The decline was due largely to the failure of the Alaskan salmon fisheries, the albacore fisheries off the coast of Washington and Oregon and the Pacific sardine fisheries.

Durum production came to 875,672 sacks, in October, an increase of 131,882 sacks over the September output, but 211,414 sacks under October, 1945.

Materials

Apple crop estimates in October were 120,657,000 bu., a rise of about 4,000,000 bu. over the September forecasts, far above last year's short crop.

Pears topped the average by 19 percent with an estimated yield of 34,389,000 bu., which was also a little higher than last year.

Cranberry production is second only to the 1937 crop with 815,100 barrels estimated for the year. This compares with the recent ten-year average of 624,100 barrels.

Chicks hatched in September totaled 26,611,000, about one half the number produced in September, 1945 and 10 percent less than the 1940-44 September average. During the first nine months of the year, 1,103,670,000 chicks were produced, 26 percent less than were produced during the same period last year.

Indexes

The commodity price index on food, compiled by the New York Journal of Commerce, came to 191.7 for the week ending November 9, which compares with 190.3 for the previous week, 138.9 a month ago, and 112.1 for November, 1945.

Business Week's index of business activity stood at 184.9 for the week ending November 2. It was 185.4 a week before, 181.8 a month ago and 161.3 a year ago.

CONSTRUCTION NEWS

	Pending (thousands)	Awarded November 1946 (thousands)	Total Awarded 1946 (thousands)
Bakery	$ 1,115	$ 205	$ 4,808
Beverages	690	139	23,617
Canning and Preserving	465	....	6,098
Cold Storage	506	335	8,456
Confectionery	55	....	2,470
Grain Mill Products	683	60	14,799
Ice, Manufactured	....	55	1,170
Meats and Meat Products	190	510	3,753
Milk Products	262	491	16,474
Miscellaneous	1,142	213	25,073
	$5,108	$2,008	$106,718

New!
20-Mill
Plastic

Basco-TEX

PLASTIC
APRONS!

Will Not Crack or Peel

POSITIVE PROTECTION against WATER, OIL, ACIDS, ALKALIES

NO LAUNDERING *Just wipe off with a damp cloth. A tremendous cost saver.*

20 MILL PLASTIC
10 Times Stronger than Cloth
Costs only about **1** *cent a day*

PRICES—SIZES—COLORS

WHITE—4 Mill Plastic
27 x 36..$ 6.62 per doz.
30 x 36.. 7.53 per doz.
36 x 40.. 7.96 per doz.
36 x 44.. 8.85 per doz.
Full Length Sleeves $6.00 per doz. pair

BLACK or WHITE—8 Mill Plastic
27 x 36..$ 9.00 per doz.
30 x 36.. 9.75 per doz.
36 x 40.. 11.15 per doz.
36 x 44.. 13.65 per doz.
Full Length Sleeves $10.65 per doz. pair
Leggings, Hip Length $13.10 per doz. pair

BLACK—12 Mill Plastic
27 x 36..$10.25 per doz.
30 x 36.. 11.15 per doz.
36x40.. 14.25 per doz.
36 x 44.. 15.80 per doz.

Maroon — Heavy Double Coated Neoprene
27 x 36..$12.90 per doz.
30 x 36.. 14.00 per doz.
36 x 40.. 18.33 per doz.
36 x 44.. 20.50 per doz.
Full Length Sleeves $12.90 per doz. pair
Leggings, Hip Length $23.50 per doz. pair

BLACK — Heavy Double Coated Neoprene
27 x 36..$12.90 per doz.
30 x 36.. 14.00 per doz.
36 x 40.. 18.33 per doz.
36 x 44.. 20.50 per doz.
Full Length Sleeves $12.90 per doz. pair
Leggings, Hip Length $23.50 per doz. pair

BLACK or WHITE—Extra Heavy 20 Mill Plastic
27 x 36..$14.20 per doz.
30 x 36.. 15.50 per doz.
30 x 40.. 20.15 per doz.
36 x 45.. 22.60 per doz.
Full Length Sleeves $14.25 per doz. pair
Leggings, Hip Length $25.75 per doz. pair

ALL PRICES F.O.B. Chicago.
Minimum order 1 dozen.
ORDER BY MAIL OR PHONE TODAY
Free Sample Swatch on Request

ASSOCIATED BAG & APRON CO.
218 West Ontario St., Chicago 10, Ill.
Phone SUPerior 5809

What Washington Thinks

By R. S. McBRIDE, Washington, D. C.

BAD TIMING!—The Army is testing the acceptability of canned bread by having field trials on 5,000,000 cans of this new ration material. Other food industries certainly wish that the Quartermaster Corps had chosen some other time for this experiment. There is quite a bit of criticism of the Army for taking 5,000,000 cans from the inadequate supply available at present to the food industries. Even those who are glad that Uncle Sam is doing some sound investigations, without waiting for an emergency period, wonder why this particular investigation was not delayed a bit.

NEW STARCH—Undersecretary of Agriculture N. E. Dodd has complimented Corn Products Refining Co. for its successful development of starch, sirup, and dextrose from grain sorghums. Thus a wartime project extending the raw material supplies for these carbohydrates is encouraged by the department, which would like to have a larger permanent market for this new crop that is of growing importance in much of the Middle West. The department says, "The greater industrial use that will result from the erection of a large plant in Texas will undoubtedly expand the importance of grain sorghums in the over-all crop pattern of the Southwest."

RETURN LOADS—Processors of frozen foods, and other products that require refrigeration, naturally find that transportation in refrigerated equipment from factory to warehouse or to market is an important cost factor. These firms are now seeking to find a return load. For example, one freezer on the East Coast who is planning to move his output to warehouses in the Mississippi Valley by refrigerated truck would like to bring back fruits or vegetables even though these Mid West products do not require frozen storage. They can be well cared for at mild temperatures, and they bear much of the transport cost—a large advantage as compared with an empty return. Important technical factors involved in the planning of these movements are both seasonal coordination and proper operation of the cooling equipment so that each load gets its optimum temperature handling. Rather obviously, technologists are going to be in charge of the programs as they evolve.

WHO EATS IT?—Official estimates of the Department of Agriculture are that, during 1947, American food supplies will be 89 percent consumed by civilians, 3 percent for military usage, and 8 percent for export. The food industries that have been supplying the military and export markets will note that their types of goods and packaging must now be more for civilian service than at any time during the last five years. A bit of technical adjustment is indicated.

POST MORTEMS—Control of prices and allotments of commodities of interest to the food industries are passing rapidly out of the picture. But executives and technologists must remember that the Government requires that copies of all records, reports, and documents that were required during the control period must still be retained. In almost every case they are required for legal purposes as part of the company's records, at least until July 1, 1947. In many other instances they must be kept for a full calendar year after the date of decontrol. It is not unlikely that with the abandonment of active control effort there will be considerable attempt on the part of the remaining staffs of OPA to dig into old proceedings. Whether this may result in attempts at prosecution for alleged violation of rulings is not clear. But even though prosecution is not undertaken, prudent management will maintain the required records at hand to demonstrate just what was done.

ELECTION IS OVER—For the next twelve months it is going to be much easier to get both administrative and legislative action in Washington on

CHANGE OF ADDRESS

DIRECTOR OF CIRCULATION, FOOD INDUSTRIES
330 WEST 42nd STREET, NEW YORK 18, N. Y.

Please change the address of my Food Industries subscription.

Name .....

Old Address .....

New Address .....

New Company Connection .....

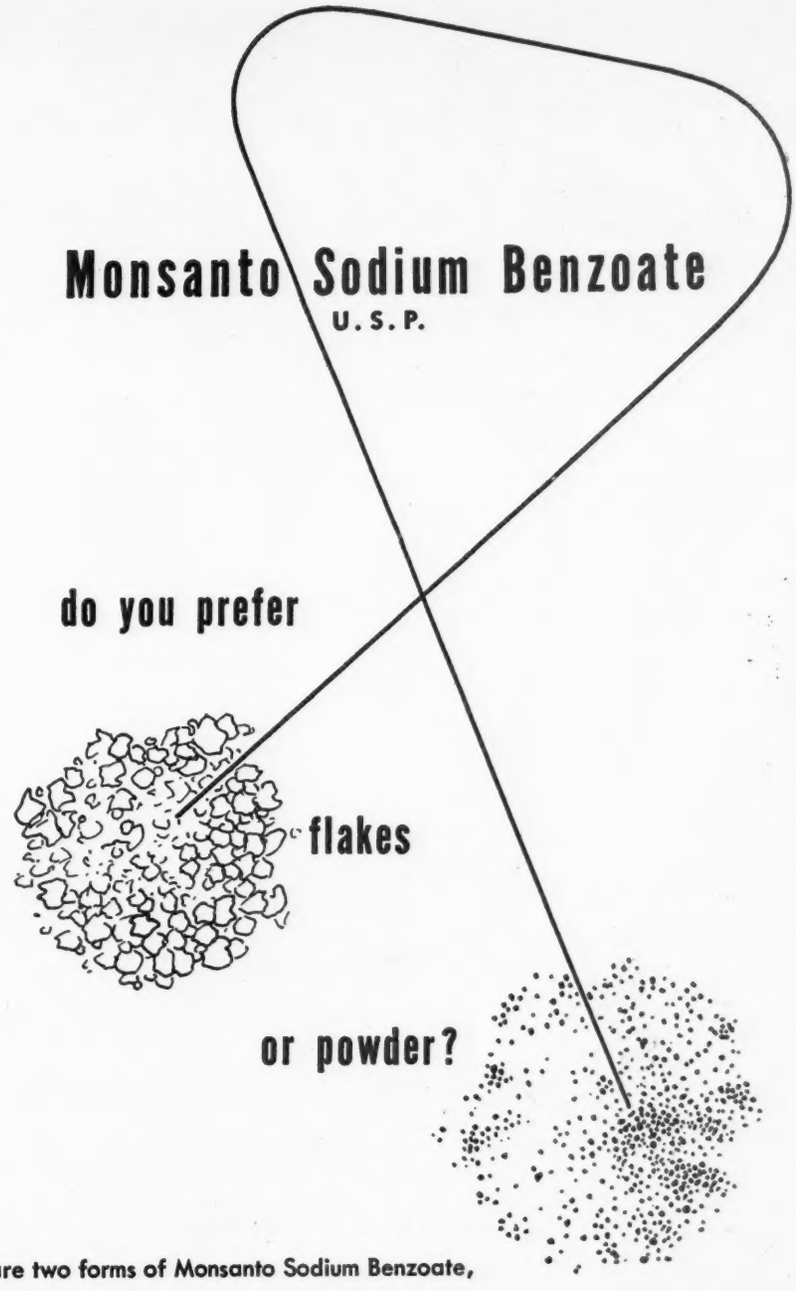
New Title or Position .....

subjects that have potential political meaning than it will be during the following year. Those who need rulings or laws to permit effective business action are less likely to become subjects of purely political attention in 1947 than in 1948. This seems to mean that early action on such projects is worth while.

FREEZING HELPS—The economic and technical difficulties which result from seasonal variation in egg production are being eliminated to some extent by new food technology. The per capita disappearance used to be necessarily about in line with the seasonal curve for production. Now that is not necessary, because freezing of whole or separated eggs provides such a superior method of storage. The Department of Agriculture is pleased about this and notes that one of the important results is a much more uniform price throughout the year for both shell eggs and egg products.

LONGER WORK WEEK—Some government agencies are beginning to take seriously the problem of getting greater production in some industries by encouraging a longer work week. This was specifically recommended as an aid in the veterans emergency housing program, when an industry advisory committee met recently with Civilian Production Administration. It was noted on that occasion that the only way in which the housing program would get more lumber and other building materials was to have an extension of the work week by those at present employed. There remains in many of these industries no idle reserve of employables. But it is not at all clear how Washington, which has for 14 years supported Labor's desire to shorten working time, is going to be able to meet this very real limit on factory, transport, and construction activities. In some cases even overtime at generous rates seems insufficient to stimulate increase in the working period. Currently this fact is evident from the demands of John L. Lewis that the coal mine work week be reduced to 35 hours, of course without reduction in take-home pay.

CIVILIAN CONTROL—Several factors indicate that President Truman is continuing to press his program of transferring many Government activities from military to civilian control. The new Presidential research advisory board is intended among other things to establish a basic civilian research program so that Army and Navy activities as well as civilian bureaus do their research planning in the fashion of industrial and institutional thinking. Even the actual purchase plans under Army and Navy Munitions Board are now guided by the civilian chairman, Richard R. Deupree, who gives some time to this task from his busy industrial work as president of Procter and Gamble.



There are two forms of Monsanto Sodium Benzoate, U.S.P. — flake and powder. Many food processors and bottlers prefer the flake form because it flows more freely and evenly than powder, does not lump or ball, creates less dust, and is therefore less objectionable to operators. Because of these advantages, it is easier to handle and blend for consistently uniform results.

Whether you choose flake or powder, depends on your own preference. In either case, samples of both are available, together with technical information and data. Contact the nearest Monsanto Office, or write: MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri. District Offices: New York, Chicago, Boston, Detroit, Charlotte, Cincinnati, Birmingham. Los Angeles, San Francisco, Seattle, Montreal, Toronto.

MONSANTO CHEMICALS
SERVING INDUSTRY...WHICH SERVES MANKIND

Corn Oil Lecithin

VODOL

for

PACKING INDUSTRIES
BAKING
CONFECTIONS
MARGARINE
DRUGS and
COSMETICS

stabilizer
antioxidant
emulsifier (as agent)
natural phosphatide extract of corn oil perfected by our process

Check these reasons why VODOL Corn Oil Lecithin is fast becoming the lecithin in so many industrial plants today:

Neutral as to odor and taste in end use.

Instantly soluble at low temperatures. Needs no pre-heating, predissolving, straining or thinning.

Pours freely — easily handled, in liquid, solid or semi-solid fats.

AVAILABLE NOW for immediate shipment in drums of 500 lbs., 50 lbs. and 25 lbs. Smaller units by arrangement.

WRITE TODAY FOR FREE SAMPLE . . . enough for full run

REFINING UNINCORPORATED
407 S. Dearborn Street
Chicago 5, Illinois

PLEASE SEND FREE LIBERAL SAMPLE OF VODOL

NAME.....

FIRM.....

ADDRESS.....

CITY..... ZONE..... STATE.....

F1246

REFINING *Unincorporated*
407 S. Dearborn St., Chicago 5, Illinois

MEN • JOBS • COMPANIES

INDUSTRY

J. R. Agen has opened a fourth frozen food processing plant in Nampa, Idaho. The $400,000 unit supplements other Agen plants at Kennewick, Burlington and Everett, Wash.

Alabama Flour Mills, Decatur, Ala., is going ahead with a $225,000 expansion program designed to double the company's size and increase storage capacity to 800,000 bushels of wheat.

Alabama State Planning Commission has recommended establishment of a poultry processing plant at Bay Minette, Ala., at a cost of $126,000. The plant would employ 150 workers and process about 8,000 chickens daily.

The American Society of Bakery Engineers has opened a new headquarters office in Room 1354, LaSalle Wacker Building, 121 W. Wacker Drive, Chicago 1. Victor E. Marx, secretary-treasurer, will be located there.

J. B. Carr Biscuit Co., Wilkes-Barre, Pa., at a special stockholders meeting, approved the company's projected merger with the Consolidated Biscuit Co., Chicago. Consolidated Biscuit stockholders formerly had ratified the proposal.

Civilian Production Administration, during the period from March until mid-October, approved the following food industries' plant construction projects: Borden Co., Plymouth, Wis., processed cheese plant; American Home Foods, Elkhart, Ind., baby foods and fruits; American Crystal Sugar Co., Denver, Colo., plant at Moorehead, Minn., and Corn Products Refining Co., Kansas City, Mo.

Daniels Food Products Co., Chicago, manufacturer of French dressing, has purchased the Jels-Rite Co., Chicago, producer of pectins and citrus juices. Purchase includes machinery, formulas, equipment and good will. The Daniels executive offices will be located in the newly acquired plant after December 1.

Derby Foods, Inc. has begun construction of a four-story building in Chicago, for the expansion of its peanut butter processing facilities. The new building is expected to be completed by May, 1947.

Ford Motor Co. has sold its soybean processing plant at Saline, Mich. Sale was in accordance with the company's policy of reliquishing various projects that have no direct connection with automobile manufacture. Soybrands, Inc. was the purchaser.

W. R. VAN METER

G. F. Heublein & Bros., Inc., Hartford, Conn., has announced the appointment of W. R. Van Meter as chemist in charge of the food laboratory.

G & A Food Products, Inc., has been formed in Akron, Ohio, by Joseph W. Graf. The new corporation will manufacture spice extracts for food processors. Mr. Graf formerly was associated with the William J. Stange Co., Chicago, as salesman and general sales manager. Production and research will be under the direction of Joseph A. Adams, formerly Stange company's chief research chemist.

Southland Products Co., New York, has acquired and is now operating 800 acres of experimental farms in Florida. The farms are being used for research into the growing of Northern fruits and vegetables for quick freezing in Florida. Experiments are being conducted in cooperation with the Agricultural School of the University of Florida.

Tifton Frozen Foods, Inc., Tifton, Ga., has opened its $200,000 plant, including 1200 lockers and 600 salt meat curing bins. The refrigerated basement has a capacity of 3,000,000 lb. Other features of the plant include a super market, meat rooms, chilling and aging rooms, poultry dressing department, fruit and vegetable processing department, smoke curing house and facilities for sausage making. Harry Hornbuckle is president of the firm.

Western Condensing Co., has purchased the former Stormont Chemicals, Ltd. plant near Cornwall, Ont. The plant was built by the government at a cost of $3,000,000. The new owners plan to convert the plant for the processing of whey into milk sugar and whey powder.

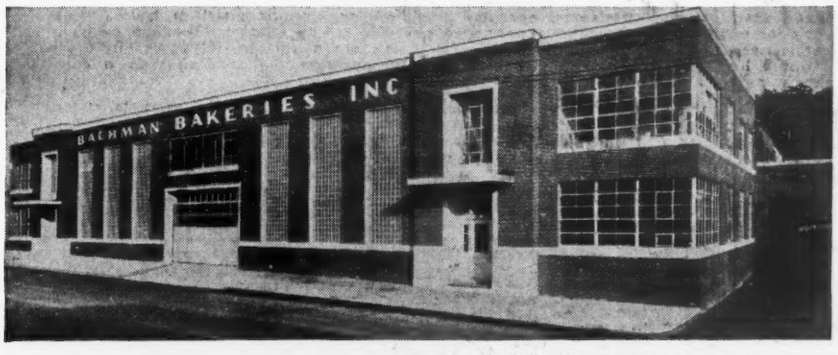
PERSONNEL

Charles S. Adams, formerly with National Dairy Products Co., has joined the staff of Little & Co., Inc., Chicago, as national consumer sales manager.

Herbert S. Bailey, manager of the Exchange Orange Products Co., Los Angeles, recently retired, ending 22 years of service with the company. James A. Finley, for many years plant superintendent at the Ontario, Calif. division, has been appointed his successor.

Charles DeBrower, associated with Keeley Bakery, Harvard, Ill., before entering the service, has joined the staff of the Bakery Division of the American Dry Milk Institute, Inc., Chicago.

Norman E. Dole has retired as superintendent of Western Sugar Refinery, San Francisco. He had been



NEW PRETZEL BAKERY

This new pretzel plant of Bachman Bakeries Inc., Reading, Pa., when in full production, will turn out more than five thousand lb. per hour. Modern traveling ovens and packing equipment will make it possible for Bachman to double its present output.

GLOBE WOVEN BELTS

ODORLESS!
TASTELESS!
WASHABLE!

Those are the "Big Three" of Globe Kanry-Tex!—Qualities of prime importance to belt users in food industries.

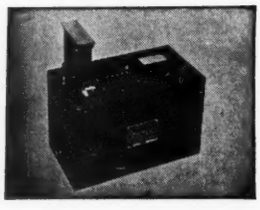
But there are other assets of Globe Kanry-Tex which have made it the choice of leading food processors everywhere. For instance, Kanry-Tex resists moisture, alkali, fats and oils. It's strong and durable. It's economical.

These are not just statements—Globe Kanry-Tex has *proved* its ability to give more efficient service over a longer period of time.

We invite your inquiries—or your mill supply house will be glad to give you the dollars-and-cents facts.

GLOBE WOVEN BELTING CO.
1403 CLINTON STREET,
BUFFALO 6, N. Y.

ONLY 1 MINUTE
To Make a Test!
with a
Steinlite



When used by an experienced operator it is "the one minute moisture tester." It is easy for anyone to become an experienced operator for no special education or training is necessary. About all one does is (1) weigh out a sample, (2) pour it into the Steinlite hopper, (3) read a meter dial, and (4) compare the reading with a chart showing percentage of moisture.

Steinlite tests wide variety of products—dehydrated foods . . . dried eggs, nuts, cocoa, etc. There are more Steinlites in use than all other electric moisture testers combined. Precision built by a firm of radio engineers and calibrated against official oven methods. Sold on free trial basis. No money down. Write for circular.

634 BROOKS BUILDING CHICAGO 6, ILLINOIS

SEEDBURO EQUIPMENT COMPANY

HARRY E. UMPHREY

A charter has been granted in Augusta, Maine, for the Maxson Maine Potato Co., wholly owned by Maxson Food Systems, Inc., New York. Harry E. Umphrey is president of the new company which will provide a source of potatoes for Maxson's precooked frozen foods.

superintendent since 1920, having worked with the refinery since 1909. Mr. Dole also was a member of the American Institute of Chemical Engineers.

Lt. William Fosdick, former liaison officer at the Quartermaster Food and Container Institute, Chicago, has been appointed sales manager of the frozen food division of Ready Foods Canning Corp., Chicago.

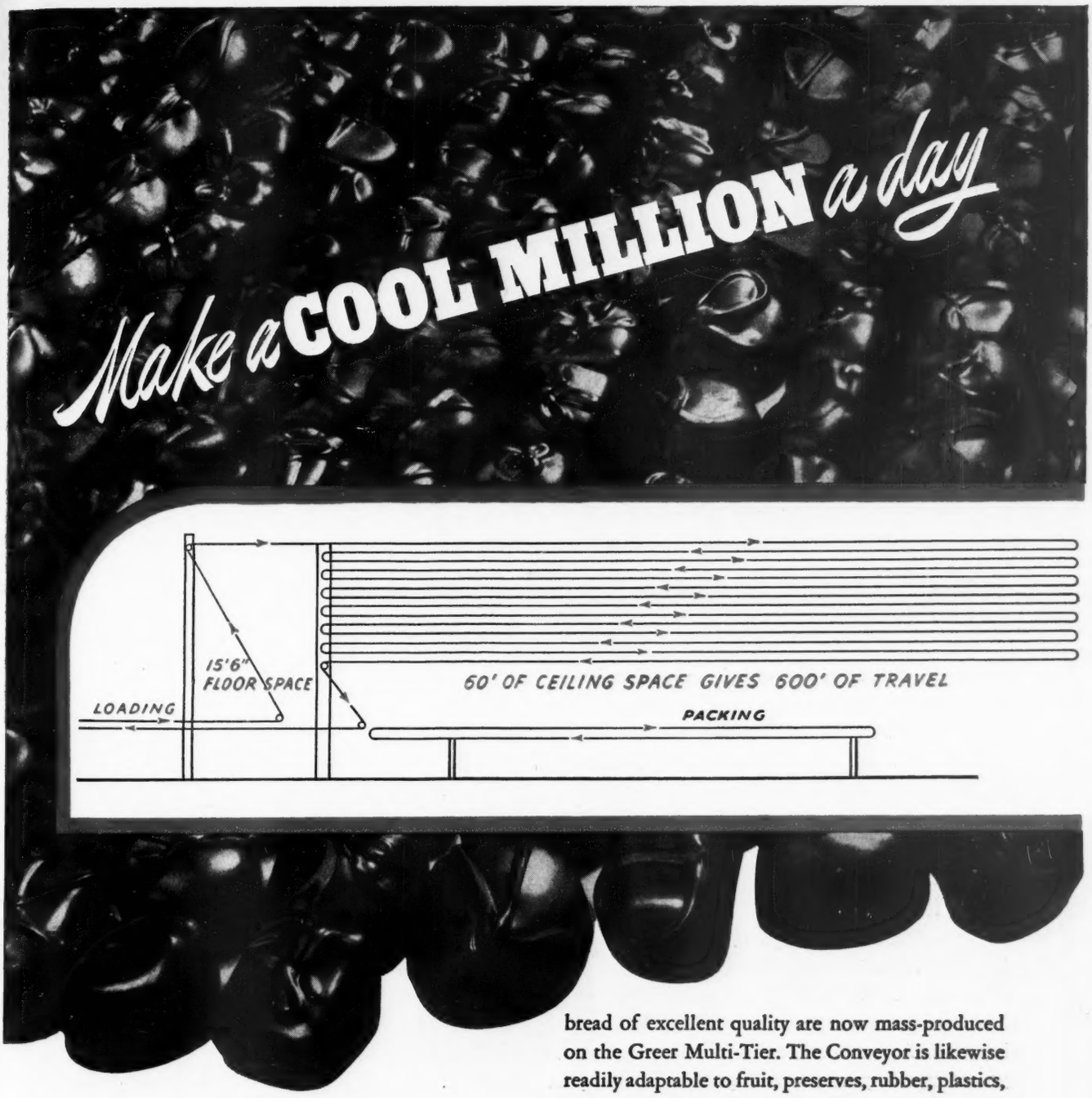
H. J. Heinz, 2nd, president of H. J. Heinz Co., Pittsburgh, has gone to the Union of South Africa to investigate the desirability of building a food processing plant in the Port Elizabeth area.

Jerome S. Jennings, president of Airline Foods Corp., New York, has announced the appointment of Thomas A. Igoe as the Corporation's director of purchasing. Airline Foods Corp. is a parent organization of a group of food manufacturers and processors who distribute foods under their own brand names.

A. E. Laufer, research chemist in vitamins and foods, has joined Cramer Products Co., New York, manufacturer of dry mixes, as head of the research and product development department.

John J. Madigan, formerly assistant deputy administrator with the Office of Price Administration, and on leave from Armour & Co., has joined Booth Fisheries, Chicago, as general manager of the quick frozen foods division. He succeeds Gene Lowey, who has retired.

Oscar G. Mayer, Jr., formerly manager of operations in the Chicago plant of Oscar Mayer & Co., has been



Greer Engineering has revolutionized the mass production of quality chocolates. The Greer Multi-Tier Conveyor *can cool a million chocolates a day*—providing 600 feet of cooling travel in only 15½ feet of floor space. The process assures chocolates of higher gloss and longer shelf life.

This unique Greer principle of cooling and conveying has been applied with outstanding success in the bakery trade, also. Biscuits, cookies, and bread of excellent quality are now mass-produced on the Greer Multi-Tier. The Conveyor is likewise readily adaptable to fruit, preserves, rubber, plastics, wax, cosmetics, and other products requiring cooling, heating, drying, or pasteurizing.

Overhead areas are readily utilized even to the height of two or three stories. This reduces the amount of non-productive floor space to a minimum. If greater mass production of higher quality goods is your goal, write at once for free Folder F-7, giving detailed information about the Greer Multi-Tier Conveyor.—J. W. Greer Company, 119 Windsor Street, Cambridge 39, Mass.

MAKERS OF FAMOUS **GREER** MULTI-TIER CONVEYORS

Let us help you speed up your

DAILY CLEANING CHORES *with* OAKITE

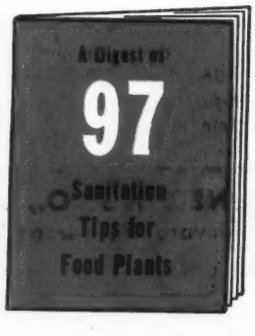
sanitation and germicidal materials

Safeguard your product quality the Oakite way

Plant Sanitation has assumed a role of major importance in safeguarding product purity. You can simplify your daily clean-up . . . put it on a low-cost basis with specialized Oakite cleaning materials and methods. They're your best bet for effective cleaning action, because they're streamlined to do away with time-consuming, back-breaking scrub and scrape methods.

START HERE! Send for a **FREE** copy of the Oakite "97" Digest and thumb through its 24 fact-packed pages for cleaning suggestions bound to help you cut cleaning time . . . meet sanitation standards with flying colors! Digest outlines step-by-step details on speeding up 97 different cleaning, sterilizing, descaling, deodorizing and related jobs . . . tips to help you safeguard product quality all along your processing line.

Your Copy— for the Asking!



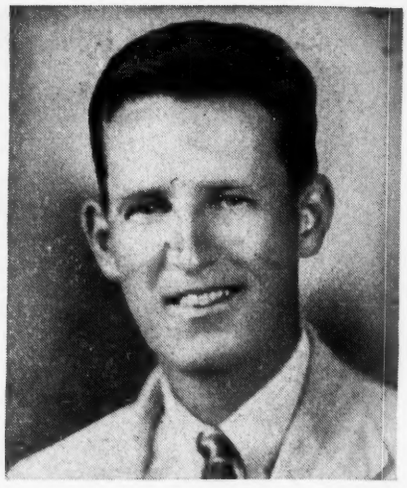
Upon request, we'll send you a free copy of this valuable, informative Oakite Digest. A call or card brings it to you immediately!

OAKITE PRODUCTS, INC., 26G Thames Street, NEW YORK 6, N. Y.

Technical Service Representatives in All Principal Cities of the United States and Canada

OAKITE *Specialized* **CLEANING**

MATERIALS • METHODS • SERVICE



EARL T. MacHARDY

Having been associated with the U. S. Dept. of Agriculture in the administration of various sugar programs, Earl T. MacHardy has joined the staff of Refined Syrups & Sugars, Yonkers, N. Y., in an executive capacity.

elected vice president in charge of operations for the Chicago and Madison, Wis. plants. Harold M. Mayer succeeds him in Chicago.

Perry E. Piper, formerly with Ramsey Laboratories, Cleveland, has taken over the ownership of the Koester Dairy, Effingham, Ill.

DEATHS

Bartlett Arkell, 84, chairman of the board and founder of Beech-Nut Packing Co., Canajoharie, N. Y., recently.

Andrew J. Baker, 59, superintendent of Ira Wilson Dairy Co., Adrian, Mich., recently.

Clarence W. Bond, 60, president of Bond Pickle Co., Oconto, Wis., October 19.

Murry E. Brierly, chief chemist, National Biscuit Co., Carthage, Mo., October 15.

Edward P. Harker, 78, retired secretary and treasurer of Westgate Sea Products Co., San Diego, Calif., October 3.

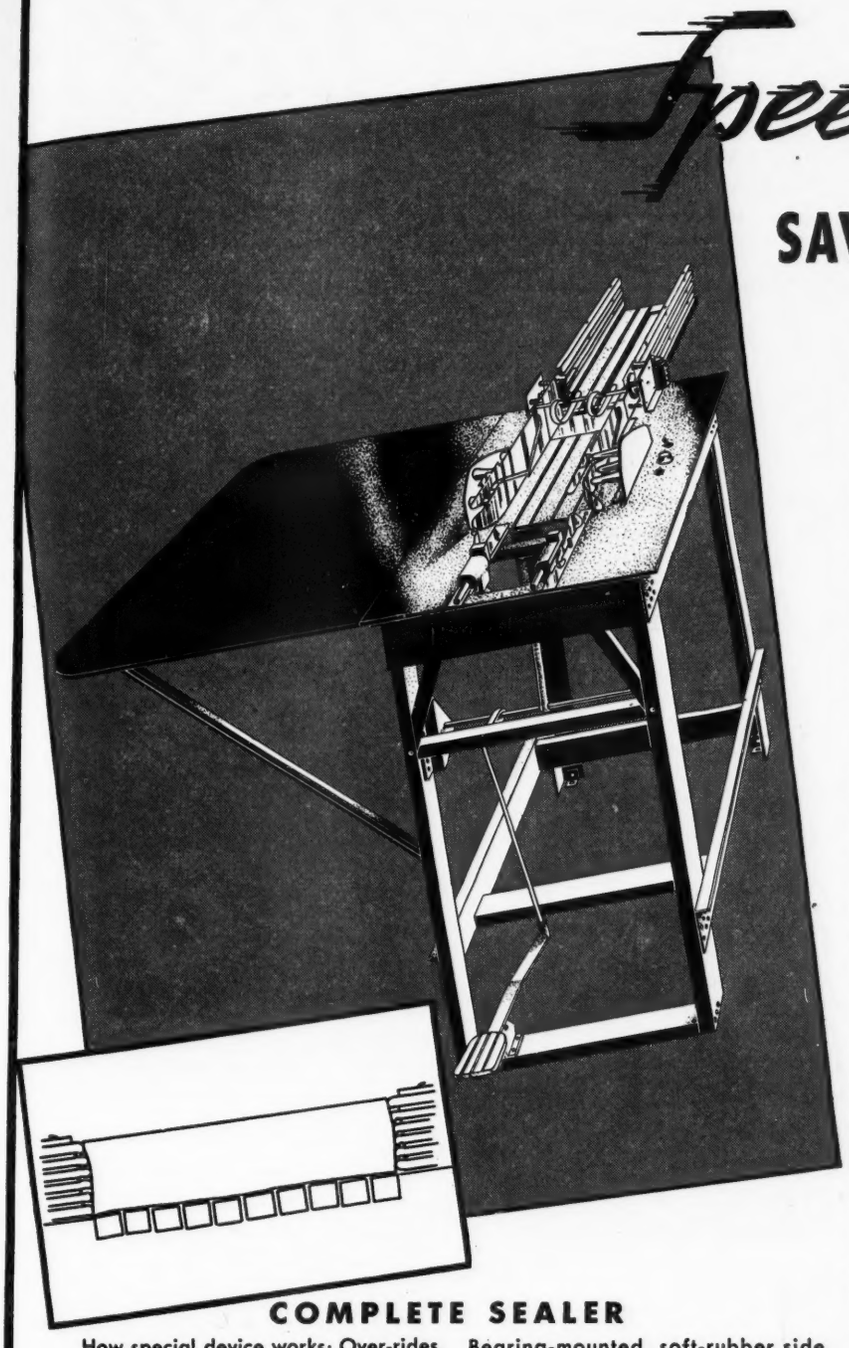
Charles W. Hess, 77, for many years associated with the Pettyjohn and American Cereal Co., and former advertising manager for Quaker Oats Co., October 18, in Churchtown, Pa.

A. G. Hoadley, 65, president, Middle Western Division of The Great Atlantic and Pacific Tea Co., October 28.

Milton W. Larsen, 55, president and treasurer of The Larsen Co., Green Bay, Wis., October 8.

Speed Wrap

SAVES YOU MONEY!



SPEEDWRAP, new design in semi-automatic heat sealing overwrapper, replaces, simplifies and accelerates hand wrapping processes. Speedwrap completely seals wax, cellophane and other heat sealing overwrappers. Special device insures complete sealing of all package humps and irregularities.

Speedwrap is especially desirable for overwrapping fresh produce packaged in trays and U-boards, bakery products, chemicals, hardware, export parts, etc.

Speedwrap mechanical simplicity and functioning ease reduce the overwrapping operations from six, in hand wrapping procedure, to only two . . . Speedwrap operators require only a minimum of training to be able to familiarize themselves with the machine and to multiply their productive capacity many times.

Speedwrap units are engineered to meet a specific overwrapping problem. This unique approach to overwrapping assures maximum efficiency and long operating life.

Speedwrap cost is low, less than the installed cost of any other comparable overwrapper in the market. If you want to speed up production at a reasonable cost, investigate new Speedwrap!

COMPLETE SEALER

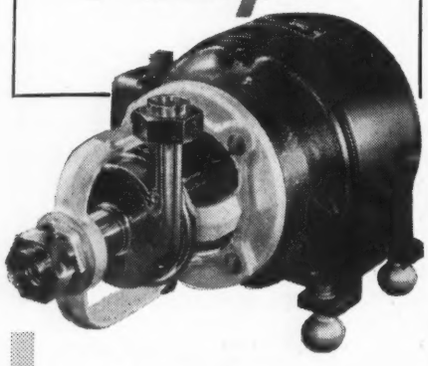
How special device works: Over-rides push carton against heated, spring-loaded fingers, which trace contour of bottom of carton. Bearing-mounted, soft-rubber side sealers flow into and over side bumps and irregularities. Result: A complete seal!

SHORT TERM DELIVERY.
CLIP COUPON
AND WRITE US TODAY!

HOWARD ENGINEERING CO., DEPT. C-9
6620½ Sunset Boulevard, Hollywood 28, California

Please send me complete information on the new Speed-Wrap machine. The package we wrap is .....in. x.....in. x.....in. Type of overwrap .....
Product being wrapped .....
Firm Name .....
My Name .....
Address .....
City ..... **Zone**..... **State**.....

Flexflo
STAINLESS STEEL
Pumps



For Milk, Cream, Ice Cream Mix, Fruit Juices, and other liquid food products.

•

Foamless

•

Sanitary

•

Easy to Clean

2,000 to 100,000 pounds of milk per hour. See your Cherry-Burrell man or write today.

CHERRY-BURRELL CORPORATION

427 West Randolph Street,
Chicago 6, Illinois

Milk and Food Plant Equipment and Supplies

FACTORIES, WAREHOUSES, BRANCHES, OFFICES OR DISTRIBUTORS AT YOUR SERVICE IN 52 CITIES

R. C. Sims, 63, general superintendent in charge of dairy and poultry plants, Swift and Co., Chicago, recently.

Robert Young, 83, owner of the Frances Willard Candy Co., Columbus, Ohio, October 13.

ASSOCIATED INDUSTRIES

Brown Instrument Co., Philadelphia, has added a group of forty-five sales and service engineers to its field staff. The men will be assigned to the various regional offices and branches throughout the country.

Chisholm-Ryder Co., Inc., Niagara Falls, has announced its acquisition of the common stock of the Ayars Machine Co., Inc., Salem, N. J., manufacturer of fillers and other food processing machinery. Trade name of CRCO-Ayars will be used.

The Girdler Corp., Louisville, Ky., through its vice-president, John E. Slaughter, Jr., has announced the appointment of Allen M. Bond, Jr., as sales manager of the Votator division's fats and oils section.

Creamery Package Mfg. Co., Chicago, has elected Otto P. Heller as secretary. He succeeds the late R. F. Davis.

Link-Belt Co., Chicago, has announced the retirement of William C. Carter as president of the company. He continues as a director and is succeeded in the presidency by George P. Torrence, formerly executive vice-president.

Jas. P. Marsh Corp. has received CPA approval to construct a new factory and office building in Skokie, Ill., Chicago suburb. The company manufactures industrial instruments and heating specialties.

Niagara Filter Corp., Buffalo, is undertaking an expansion program which includes the acquisition of new plant facilities and a 100 percent increase in working force.

Reynolds Metals Co., Chicago, announces the appointment of J. F. Van Kennen as assistant to the president. His particular assignment will be to make a survey of Latin America. Mr. Van Kennen formerly was assistant general sales manager of the Central Aluminum Division.

York Corp., York, Pa., has appointed Edwin P. Vanderwicken as secretary and treasurer. He formerly was assistant to the president of Signode Steel Strapping Co., Chicago.

Vi-Co

NATURAL "B" COMPLEX YEAST VITAMIN PRODUCTS AND YEAST DERIVATIVES

Plasmolyzed Yeast Extracts for FOOD and AMINO ACID PREPARATIONS

Vi-Co Plasmolyzed Yeast Extracts are prepared by enzyme digestion of brewers' yeast to yield a B complex product rich in essential amino acids. Amino acids provide the necessary "building blocks" for healthier and stronger bodies.

These products possess a definite "meat-like" flavor useful in enriching soups, bouillon cubes, tomato juice and other packaged foods. Such enriched foods are also of value for their natural B complex and high amino acid composition.

Consult us about your vitamin or yeast problems. Our technical staff can best advise you how Vi-Co products can be used to enrich your own products.

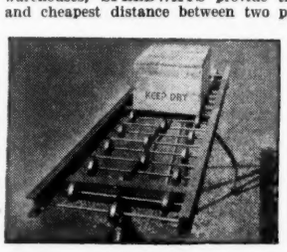
VICO PRODUCTS CO.
415 W. Scott St. • Chicago 10, Illinois

SPEEDWAYS
CUT HANDLING COSTS!

EVERY TIME one of your employees handles a package, carton, box or case, IT COSTS YOU MONEY! You can save labor costs, cut handling charges, save valuable time, energy and effort by installing low-cost SPEEDWAYS GRAVITY CASE CONVEYORS . . . and you'll "up" production at the same time.

SPEEDWAYS IS MULTI-PURPOSE . . . VERSATILE . . . UNLIMITED IN APPLICATION.

On production lines . . . on loading platforms and in warehouses, SPEEDWAYS provide the shortest, fastest and cheapest distance between two points.



SAVE
TIME!
LABOR!
MONEY!

SPEEDWAYS 3 standard widths (12" - 15" - 18") with 6, 8, or 10 wheels per foot — can handle 90% of all cases, boxes, packages, etc. Arrangement of ball bearing wheels can be altered to suit individual needs.

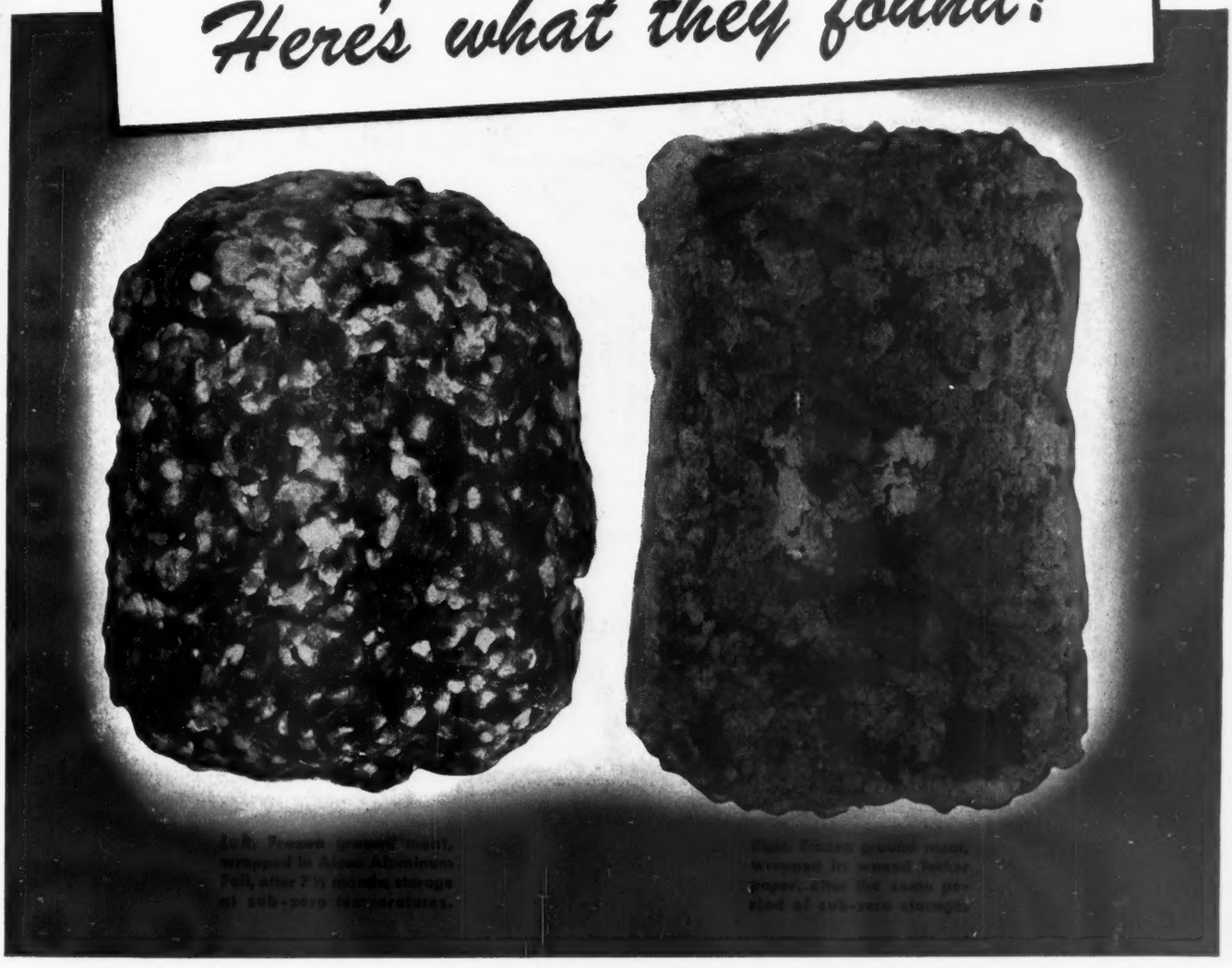
Write for FREE, 2 color illustrated folder

Represented by experienced Material Handling Equipment Engineers in principal cities.

SPEEDWAYS CONVEYORS, INC.

1263 NIAGARA ST., BUFFALO 14, N. Y.
Visit our Booth No. 407—"Materials Handling Exposition." Cleveland, January 14-17

WHEN THEY TOOK OFF THE WRAPS, *Here's what they found!*



After 7½ months of storage at sub-zero temperatures, two samples of frozen ground beef were unwrapped and tested.

Here's what they found: The sample (shown at left above) that was wrapped in a combination structure of Alcoa Aluminum Foil and paper showed no loss of color and flavor, had lost only 0.23% in weight. The sample of ground beef shown at the right was wrapped in ordinary waxed locker paper. It lost 9.5% in weight during the same period and showed serious loss of color and flavor.

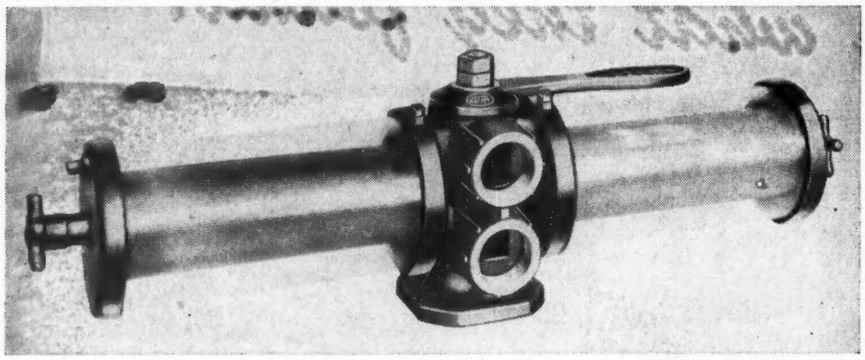
Being metal, Alcoa Aluminum Foil has an MVT (moisture vapor transmission) factor of practically zero. Foods wrapped in aluminum foil are protected from oxidation, desiccation and loss of flavor and color. And aluminum is *friendly to food* . . . will not impart strange tastes and odors to the contents.

Leading converters make bags, cartons, bags-in-cartons and other types of wraps using Alcoa Aluminum Foil laminated to a variety of strong, easy-forming supporting sheets. Their experts can aid you in planning better packages for the future. Write us for their names. ALUMINUM COMPANY OF AMERICA, 1845 Gulf Building, Pittsburgh 19, Pa. Sales offices in leading cities.

ALCOA

ALCOA ALUMINUM FOIL

FOOD EQUIPMENT NEWS



Duplex pipe line strainer encased in transparent Lucite for visual inspection.

Strainer

To permit visual inspection, a duplex pipe line strainer has been devised by the J. A. Zurn Mfg. Co., Dept. I, Erie, Pa. The strainer is encased in transparent Lucite, so that without disturbing the strainer the operator can readily see whether or not it needs cleaning. When it does, flow can be diverted into the other chamber, without loss of pressure, and the chamber requiring cleaning can be taken apart while the pipe line maintains its normal flow.

Strainer baskets are available in brass, monel, or other specified metal.

Offset Joints

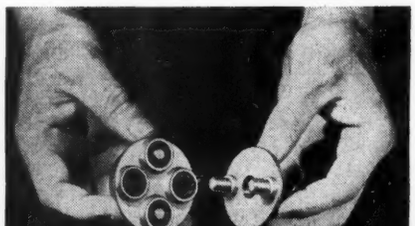
A STANDARD line of offset joints for joining pipe terminals that are not in line has been announced by Magni-Lastic, a division of Cook Electric Co., Dept. I, 2700 Southport, Chicago 14, Ill. The MagniLastic offset joint is constructed with an equal number of expansion flanges on either end of an insert section. Length of unit and number of flanges are determined by misalignment condition to be corrected. Offset joints are supplied with bellows flanges, which include pressures from vacuum to 1,000 psi, pipe sizes from ½ to 24 in., and temperature from minus 300 to plus 1600 deg. F. Joints of stainless steel, Monel, Inconel and copper cover all common corrosive conditions. End fittings are available in welding end or Van Stone bolted flanges.

All Metal Butter Printer

AN all metal butter print machine with a capacity of 60 pounds per min. is being produced by Bracknell, Munro & Rogers Ltd., Dept. I, Bristol, England. Stainless steel is used in the feed hopper, worms and molding chamber, and all other parts are of stainless metals. The machine is driven by a 4 hp. motor. Pressure feed lubrication is fitted wherever possible and the main gears that drive the feed worm run in a bath of heavy oil. Size of machine 10 ft. long by 4 ft. 6 in. wide.

Miniature Couplings

TWO NEW couplings of its Morflex type for low power take-off of fractional-horsepower drives now supplement the line of larger couplings manufactured by Morse Chain Co., Dept. I, Detroit, Mich. The couplings, one for 3 and the other for 9 ft. lb. torque, weigh respectively about ½ and 1¼ lb. and are designed for a maximum speed of 3,600 r.p.m., the smaller with a bore of ¼ and the larger of 1 in. As in the larger couplings of this type, a flexible neoprene "biscuit" assembly is used to cushion shocks and permit slight angular misalignment while transferring maximum power.



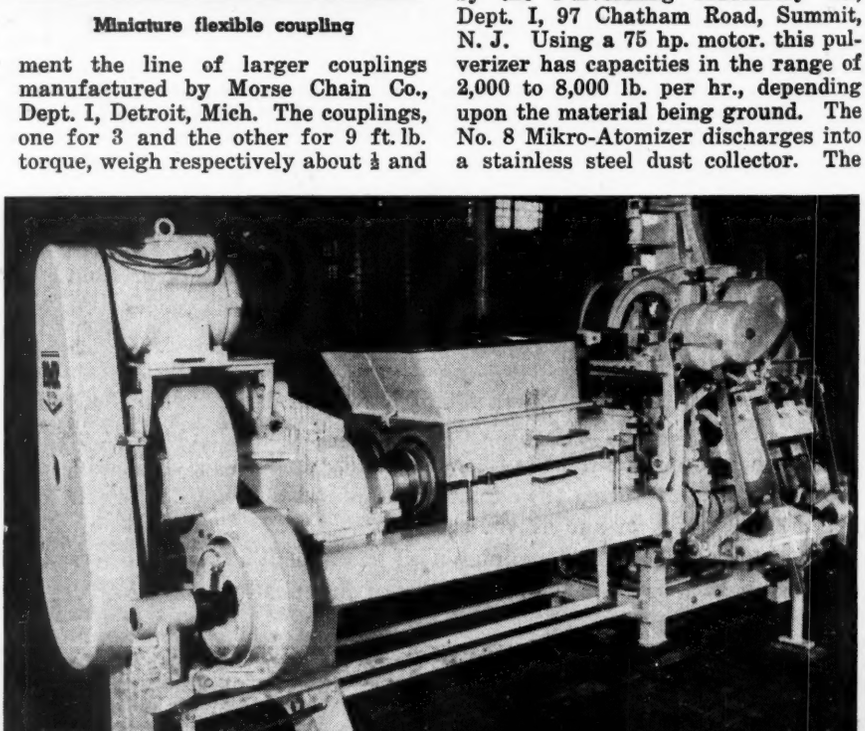
Miniature flexible coupling

Valves

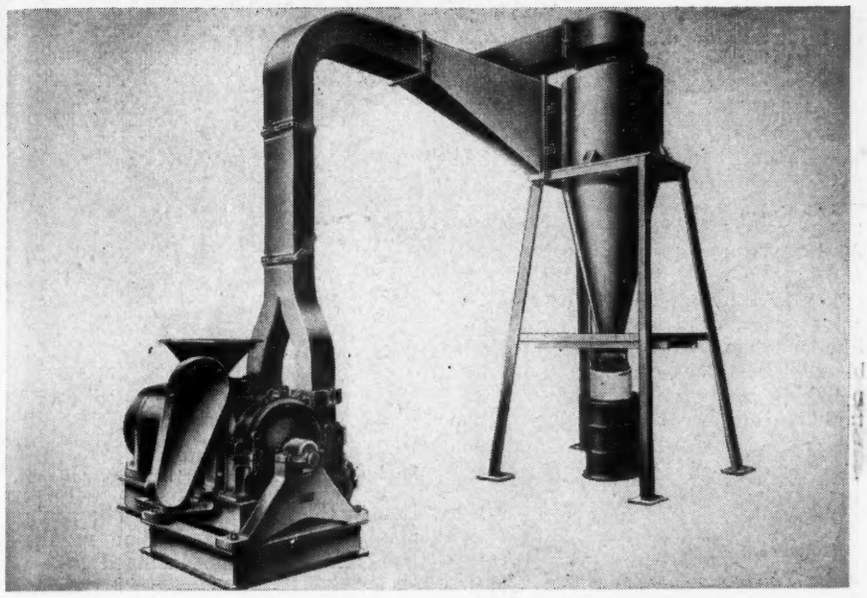
A COMPLETE new line of single-seated, fully balanced diaphragm regulating valves for process industries has been announced by Leslie Co., Dept. I, 89 Delafield Ave., Lyndhurst, N. J. These valves are made with cast iron, bronze, and steel bodies for steam, air or gas pressures up to 1,000 psi., and are designed to be actuated by standard pressure or temperature instruments or controllers, using 20 psi air or clean water. They are supplied with hardened stainless steel main valves and stellited seat rings, and provide equal or greater capacities than most double-seated regulating valves of the same size. They have the additional advantage of being absolutely tight in dead-end service.

Pulverizer

CAPABLE of producing ultra-fine powders in the range of 1 to 25 microns in large production quantities, a new Mikro-Atomizer has been announced by the Pulverizing Machinery Co., Dept. I, 97 Chatham Road, Summit, N. J. Using a 75 hp. motor. this pulverizer has capacities in the range of 2,000 to 8,000 lb. per hr., depending upon the material being ground. The No. 8 Mikro-Atomizer discharges into a stainless steel dust collector. The



All metal butter print machine has capacity of 60 pounds per minute.



Large production Micro-Atomizer connected with stainless steel dust collector.

basic principle of operation lies in separating and recirculating the ground particles by a balanced reaction between centrifugal force and air flotation in such a way that the smaller particles, which meet the size specifications, are discharged from the mill while the larger sizes are retained in the grinding section for further reduction. The mill is of duplex construction, insofar as it embodies on each side of the single centrally located rotor one dispersion ring, one separator wheel and one fan, but all assembled on a single drive shaft and one composite housing.

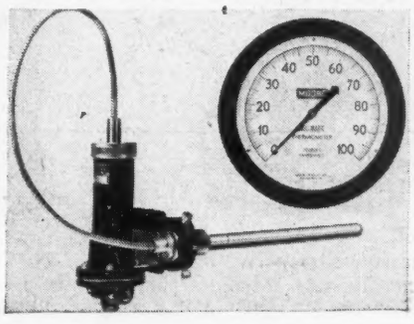
Lift Truck

A 4,000 lb. fork-type lift truck with pneumatic tires, termed the "Hyster 40" has been announced by the Hyster Co., Dept. I, Portland 8, Oregon. Using a Wisconsin air-cooled motor, a trunnion steering and 7.00 x 12 pneumatic tires, the truck, similar in appearance to other units, is well adapted for use over any type of indoor or outdoor road surfaces.

Thermometer

A NEW type of thermometer that converts temperature to air pressure and transmits this pressure to a receiving indicator, recorder or controller, has been announced by Moore Products Co., Dept. I, H & Lycoming Sts., Philadelphia 24, Pa. This thermometer operates on a pneumatic "null" balance principle in which the pressure in a gas-filled thermal element is balanced by air pressure. It provides high-speed pneumatic transmission of the measured temperature over distances of 1,000 ft. or more and eliminates the need for long lengths of capillary tubing.

The gas-filled thermal element consists of a bulb, double armored capillary only 24 in. long, and a sealing bellows. Standard thermal elements with either of two filling pressures serve for temperatures as low as 150 deg. F., and as high as 800 deg. F. The operating range may be reset



Nullmatic thermometer

over wide limits by the use of a suppression adjustment in the transmitter, which is also used for setting zero. There are no friction producing linkages or bearings in the transmitter. Standard instruments are furnished to operate over spans of 100, 150, 200, 300, 400, 500, 600 and 800 deg. F.

Safety Barrel Stand

TO ENABLE liquids to be dispensed readily from 55 gal. bulged barrels or straight-side drums, Western Machine Works, Dept. I, Bruni, Tex., has developed an all-metal, all-welded stand fabricated of 2-in. steel pipe attached to an angle iron base by means of hinge pins so that the frame can be tilted forward or back. To place the barrel in the stand, it is placed on end directly in front of the stand and the frame lowered until it can be secured to the barrel by means of a cradle which may be cinched tightly to either straight or bulged barrels by means of a special notched binder. The frame is then raised and automatically locked in upright position, after which the cradle can be rotated by means of a lever and the barrel locked in either vertical or horizontal position. The device can be operated by one man without danger of strains.

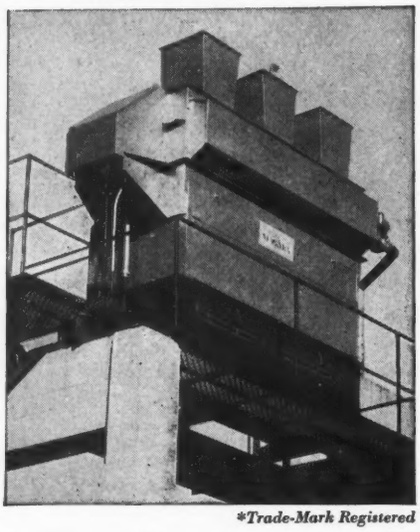
Industrial Valves

PRODUCTION of a series of industrial valves incorporating a number of new design features is announced by Parker Appliance Co., Dept. I, 17325 Euclid Ave., Cleveland, Ohio. The valves are available in needle and globe types in sizes up to 1 in., and in both angle and offset designs. Both the needle and shut-off types are available in six variations of connection arrangements. Straight line types are produced with female pipe threads, or with tubing threads for the use of flexible tubing. Angle types are provided with female type threads, with tube threads, or with

Fork-type lift truck with pneumatic tires

NIAGARA *AERO-PASS CONDENSER

With Oilout, Duo-Pass and Balanced Wet Bulb Control



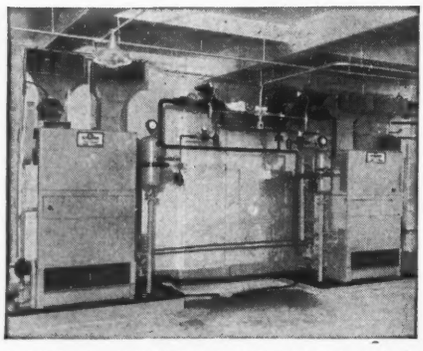
*Trade-Mark Registered

Increases refrigeration capacity and plant production. Saves power and water consumption. Essential exclusive features:

1. "Balanced Wet Bulb Control" holds compressor head pressure at the minimum—saving power.
2. "Oilout" prevents oil accumulation in refrigerant—assuring full capacity.
3. "Duo-Pass" precooling coil eliminates scaling of condenser coils—assures uninterrupted service at full capacity.

Write for Bulletin 101-FI

NIAGARA "NO FROST" METHOD of Refrigeration



With the NIAGARA "NO FROST" Method you always have full capacity with never any refrigeration loss from frosted coils.

Write for Bulletins 83-FI and 95-FI

NIAGARA BLOWER COMPANY

Over 30 Years of Service in Industrial Air Engineering

405 Lexington Ave., New York 17, N. Y.

Field Engineering Offices In Principal Cities

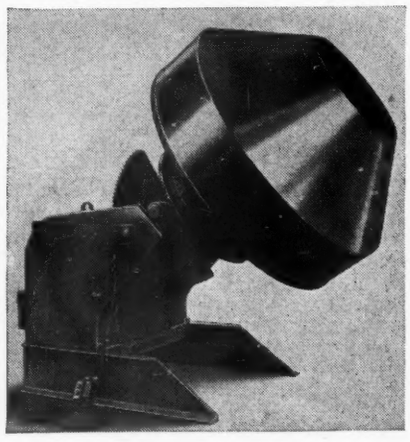
NIAGARA

AIR ENGINEERING EQUIPMENT

male pipe threads at the inlet connection and either tube or female pipe threads at the side outlet. Tubing is accommodated in a range from ¼ in. to 1 in. outside diameter, pipe from ⅜ to 1 in. The valves are of the non-rising stem type, and can be repacked under full-flow or no-flow conditions. Tapered hexagon machining insures a snug-fitting handle.

Rotating Mixer

A ROTATING pan-type, motor-tilted and motor-rotated constant speed mixer is announced by Ransome Machinery Co., Dept. I, 1412 South 2nd St., Dunellen, N. J. It is for mixing, blending, coating, coloring, tumbling, polishing and finishing of candies, tablets, candy-coated chewing gums,



Rotating pan-type mixer

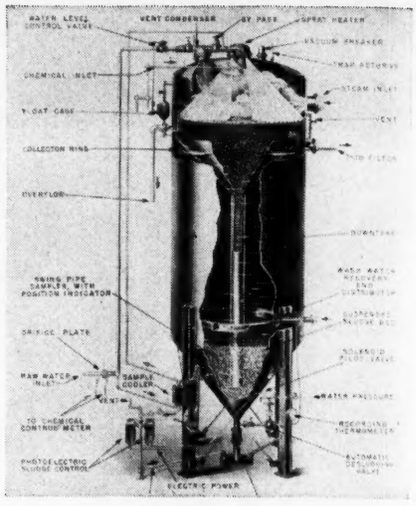
pills, etc. A variable speed drive can be furnished where materials handled require the rotating speed to vary. The pan is of all metal construction with joints welded and ground smooth.

They are available in sizes up to 1500 lb. (50 cu.ft.) batch capacity.

Hot-process Softener

DEVELOPED by the Permutit Co., Dept. I, 330 West 42nd St., New York 18, N. Y., a new type of hot-process water softener incorporating a sludge blanket design is said to improve boiler feed water and at the same time give substantial savings in chemicals. Other advantages claimed for the four models of the new softener are reduction in turbidity of soft water, reduced load on the filters, less backwashing, and less silica left in the water.

In the tank, suspended sludge forms a bed which acts as a filter screen for fine particles. Action of this bed, coupled with the slow rate of upward flow of treated water throughout the full cross section of the settling tank, is said to give an effluent lower in turbidity than is obtainable in older types of softeners. Furthermore, when water is softened in two stages, the lower turbidity of the first-stage product reduces phosphate consumption in the second stage. The sludge blanket also decreases lime requirements since the unconsumed lime is retained in the blanket until it reacts with water hardness. Finally, the sludge blanket (when it has considerable oxide or hydroxide of magnesium) gives a higher degree of silica removal than formerly possible owing to increased time and intimacy of contact of silica particles with the magnesium. The height of the sludge blanket is automatically controlled by a photo-electric turbidity detector which automatically blows the unit down through a desludging valve as often as may be needed.

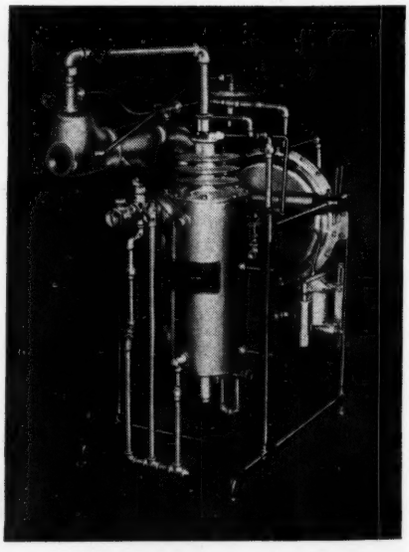


Sludge-blanket hot process water softener.

Gas Generator

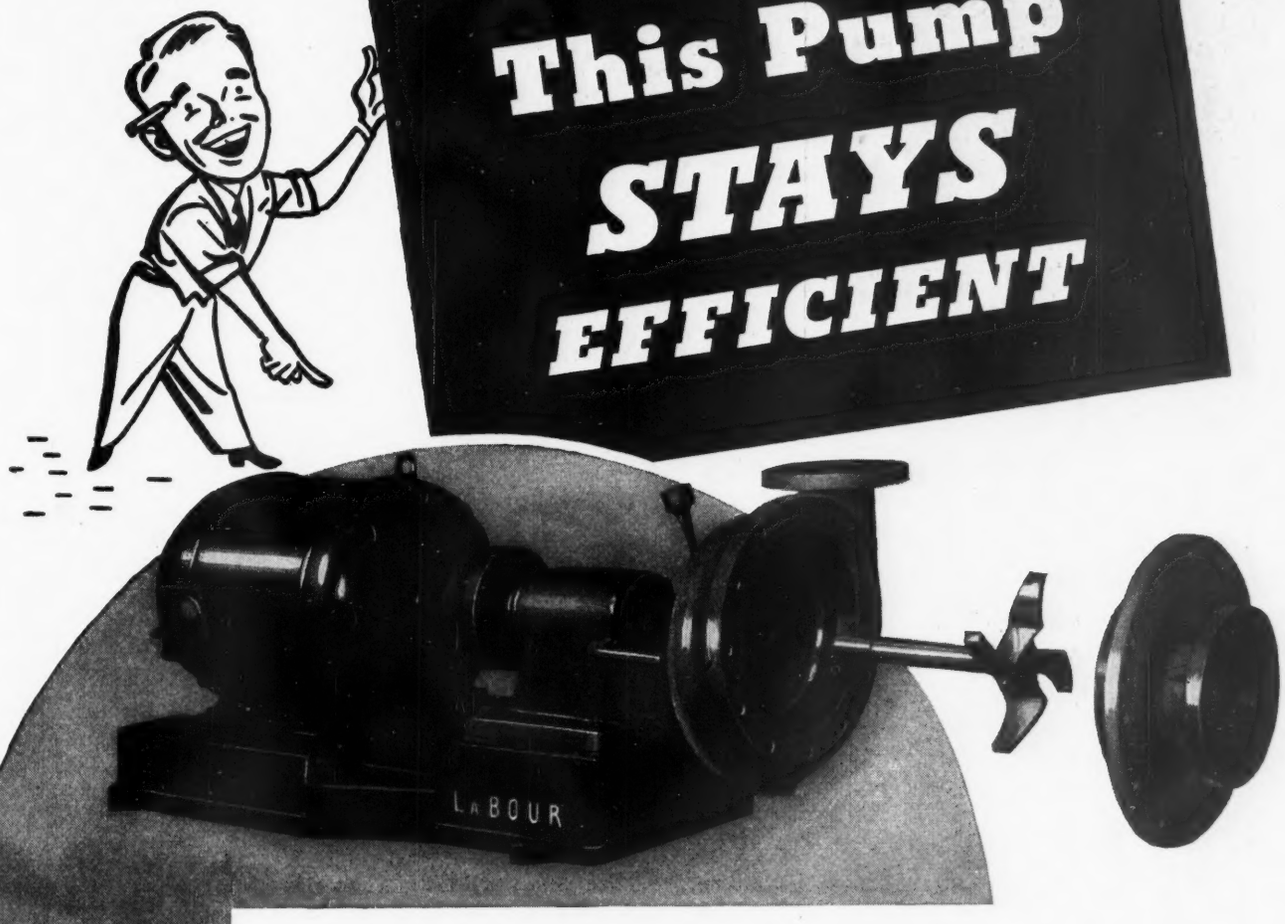
AN OIL generating unit utilizing fuel oil to generate a vapor which is then mixed with air and is piped, burned and controlled in exactly the same manner as utility gas, is announced by Vapofier Corporation, Dept. I, 10316 S. Throop St., Chicago 43, Ill. The unit provides economical, clean, sootless and odorless heat at a constant temperature.

It operates by maintaining the fuel



Industrial oil vaporizer

This Pump STAYS EFFICIENT



Since it has no sealing rings and operates without dependence on close clearances, LaBour Type Q is relatively invulnerable to the effects of wear or corrosion. It's a highly efficient centrifugal pump when new—and it *stays* efficient as it grows old.

The "exploded" view of LaBour Type Q shows all the working parts. Nothing could be simpler, and thus offer greater assurance of dependability. Impossible to show in the picture are the multiple throats which give Type Q unusual air capacity, so that it cannot air-bind in ordinary service. Type Q is listed as a non-priming pump, but its ability to handle air or vapor mixed with liquid permits its use in many services where self-priming pumps were formerly considered necessary.

There is no substitute for dependable LaBour performance. That's why we say, and say again, "If you need a LaBour, nothing else will do."

THE LABOUR COMPANY, INC.
Elkhart Indiana, U.S.A.

IF YOU NEED A **LABOUR** NOTHING ELSE WILL DO

LaBour CENTRIFUGAL PUMPS

MERCOID CONTROLS

Mercoid Controls are first choice among leading engineers throughout industry. They are used on industrial applications involving the control of temperature and pressure. Available in various ranges. Controls also for liquid level, etc.

Hermetically sealed mercury switches used exclusively in all Mercoid Controls. They are not affected by dust, dirt or corrosion, thereby assuring better control performance and longer control life. Complete catalog sent upon request.

MADE BY THE MERCOID CORPORATION 4221 BELMONT AVE. CHICAGO 41, ILL.

oil at a constant level in the combustion chamber by a simple float valve. The products of combustion are drawn through the surface of the oil in the combustion chamber, heating the oil to vaporizing temperature. The vapor thus created is drawn off through the premixer where proper fuel-air ratio is established and maintained. The combustible mixture is then piped to the burners. Flame quality may be widely varied from oxidizing to reducing. Hundreds of applications in every type of industry are to be found, from baking ovens operating at 150 deg. F. to high temperature furnaces requiring over 3000 deg. F.

Eight standard sizes are built with capacities from 70,000 B.t.u.'s per hour or 0.5 gallons per hour; to 2,000,000 B.t.u.'s per hour or 14 gallons per hour. It occupies a floor space of only 2 ft. x 4 ft.

Speed Scale

AN extremely short-fall, end tower design and amazingly simple trouble-free mechanism are characteristics of the new Detecto-Gram aluminum speed scale recently introduced by Detecto Scales, Inc., Dept. I, 1 Main St., Brooklyn 1, N. Y. Its oil-controlled dash-pot reduces indicator swinging to an absolute minimum, avoiding waste of valuable time. As a shock absorber, it ends wear and tear. It is designed with precision-perfect parts. Its easy-reading chart helps stop overweight losses.

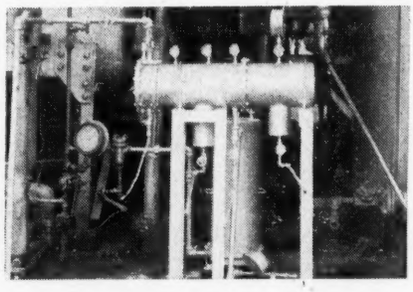
Industrial Truck

AN industrial truck that will handle light and bulky cartons as unit loads, without pallet or skid has been designed by the Automatic Transportation Co., Dept. I, 149 W. 87th St., Chicago 20, Ill.

Originally designed at the request of a major electrical products manufacturer, the truck is adaptable to light, bulk carton material. A specially modified version of an Automatic fork truck, the "clamp truck" operates with hydraulic pincers, replacing the regular forks. It is constructed so as to be adjustable to handle any size or type of carton of light and bulky commodities, such as breakfast foods, shoes, wearing apparel, etc. The truck eliminates the need for palleting in tiering, detiering and hauling operations. The clamping pads, adjustable in height, are mounted on a scissors-like frame opened by a hydraulic pump. Release of the hydraulic pressure allows the springs to pull the clamps together, grasping the load between them.

Liquid Separator

FOLLOWING several years of experimental work, the Selas Corp. of America, Dept. I, Erie Ave. and D St., Philadelphia 34, Pa., has now introduced a pilot plant and small production model of its phase separator for immiscible liquids. A device of this type, shown used in connection with a steam distillation operation, appears in the accompanying illustration. The device has no moving parts, no packing glands, no space-consuming settling tank, yet is said to be successful in breaking emulsions on steam distillation streams, on phase separation of water from carbon tetrachloride, gasoline, fuel oil, benzol and other organic liquids.



Phase separator for immiscible liquids

Essentially the separator consists of two parts, a coalescing chamber which

Clamp truck that eliminates pallets when handling light, bulky cartoned materials.

The Strength of Your Plant lies in "FIRST"-rate Machinery!

"FIRST" MACHINERY IN OUR WAREHOUSES

"FIRST" MACHINERY AVAILABLE THROUGH OUR NATIONWIDE CONTACTS

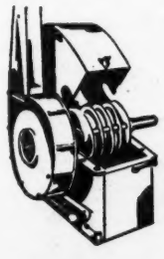
YOUR 1947 PRODUCTION

FMC

New Machinery *now available!*

FMC TUMBLING BATCH MIXERS

FMC STAINLESS STEEL KETTLES, TANKS and VACUUM PANS;



FMC PULVERIZER

Gone are the days when you could laugh at production costs! Today, with the soaring costs of labor and materials, the plant with **"FIRST"**-rate machinery and equipment is the plant that will show a **PROFIT.** The **NEW** equipment shown on this page is mostly ready to be shipped you immediately, to enable you to reach full production at top efficiency and rock-bottom cost. Yes, sir — **"FMC"** is not only eager but **READY** to serve you! Just try us!!

(P. S. Don't fail to look up our other advertisement in this issue.)

FIRST MACHINERY CORPORATION

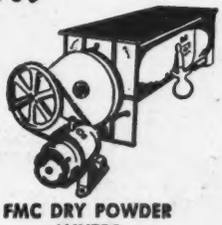
NEW HEADQUARTERS

157 HUDSON ST. NEW YORK 13, N. Y.

PHONE: WOrth 4-5900

FMC BELT CONVEYOR

STAINLESS STEEL EQUIPMENT



FMC DRY POWDER MIXERS

FMC PORTABLE AGITATORS

FMC PORTABLE CAP TIGHTENERS

FMC STRAIGHT LINE SYPHON FILLER

FMC SYPHON FILLERS

FMC VACUUM FILLER

CYCLONE CONVEYOR BELTS
3 types—a variety of metals, alloys, finishes

CHAIN LINK

FLAT WIRE

FLEX-GRID

WE are in a position to give unbiased recommendations about metal conveyor belts because Cyclone Belts are made in *three* types in a wide range of metals, alloys and finishes. We are interested in helping you determine which belt will do *your* particular job most efficiently.

Our personnel has amassed a wealth of practical knowledge during the 25 years that we have been making metal conveyor belts for industry. This technical "know how" is completely at your service when you consult us about your conveyor belt problem. Cyclone's enviable reputation for quality and dependability is your assurance of satisfaction.

When you plan to install a new belt, call the Cyclone office nearest you. Or write for *free* catalog No. 3. There is no obligation. Offices in principal cities . . . factories in the Midwest and on the Pacific Coast.

CYCLONE FENCE DIVISION · American Steel & Wire Co. · CYCLONE "Red Tag" METAL BELTS · UNITED STATES STEEL

By the makers of Cyclone Fence

CYCLONE FENCE DIVISION
(AMERICAN STEEL & WIRE COMPANY)
Dept. H-126, Waukegan, Ill.
United States Steel Export Company, New York

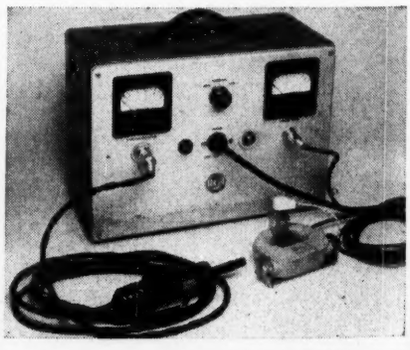
UNITED STATES STEEL

houses the coalescing medium, and a separatory chamber in which the separatory membranes are contained. The feed stream first enters the coalescing chamber, shown at the right in the illustration, where its velocity is greatly reduced, allowing finely dispersed particles to coalesce into droplets and settle into the outlet leg for discharge. Coalescence is accelerated by a coalescing medium through which the liquid mixture must flow before it can reach the separatory chamber.

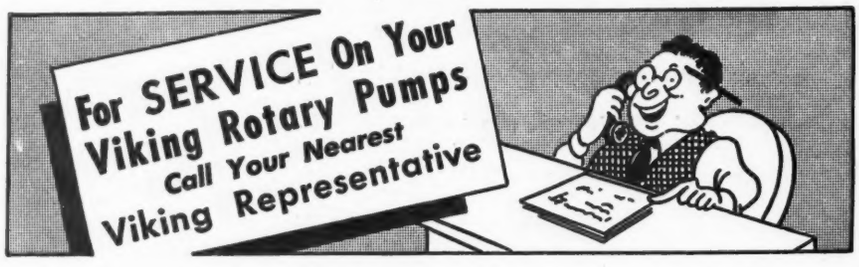
In the separating chamber the remaining aqueous phase is completely separated from the continuous hydrocarbon phase as the latter passes through a preferentially-wetted membrane which is impervious to the aqueous phase. To secure maximum separating area, the membranes are arranged in multiple, much like the chambers of a filter press. The water-repellant character of the membranes is said to be such that a single membrane will effect complete separation, so that all membranes operate in parallel, discharging to a single manifold and then to a discharge chamber and out of the apparatus. The aqueous phase settles into a second outlet leg. Other arrangements are available in case the ejected phase is the lighter liquid, rather than the heavier as described.

High Vacuum Gage

ABILITY to cover the vacuum range from millimeters to microns, without danger of burning out the measuring instruments, is incorporated in a new vacuum measuring gage designed for continuous operation at pressures as low as 0.1 micron and introduced by the Scientific Instrument Section of RCA Victor Division, Radio Corporation of America, Dept. I, Camden, N. J. Designated as Type EMG, the instrument incorporates two types of gage, a thermocouple gage for the higher pressure range, and a discharge gage for the lower. The thermocouple gage is housed in an all-metal inclosure to prevent accidental mechanical damage. The discharge gage is of a novel cold-cathode type operating on the ionization principle to give current indications proportional to very low pressures. It contains no filament to burn out. The tube is inclosed in an oval shell. A perma-



Non-burn-out high vacuum gage.



The Viking Pump Company is represented by a nation-wide sales and service organization in key cities from coast to coast . . . from Canada to the Gulf. Is your pumping installation operating at high efficiency? Do you have a pump maintenance problem? Write or call the Viking representative nearest your plant for service.

CHICAGO 6
C. W. Dennis
549 W. Washington Blvd.
Phone State 6819

CLEVELAND 13
J. A. Sinden
310 Marshall Bldg.
Phone Cherry 0687

INDIANAPOLIS 4
C. D. Sadler
207 Pennway Building
Phone Lincoln 4788

KANSAS CITY 6
F. J. Pinney
601 Pickwick Building
Phone Harrison 8033

LOS ANGELES 21
E. E. Burton
2040 So. Santa Fe Ave.
Phone Kimball 4470

MILWAUKEE 3
C. F. Mullens
610 West Michigan St.
Phone Daly 0807

NEW YORK 23
Herbert Fuhrer
1841 Broadway at 60th St.
Phone Circle 7-3324

BALTIMORE 1
Wallace Stebbins Co.
Charles & Lombard Sts.

BIRMINGHAM
Pump Shop, Inc.
1015 7th Ave. So.

BOISE
The Olson Mfg. Co.
P.O. Box 1487

BOSTON 10
Hayes Pump & Mach. Co.
125 Purchase St.

BUFFALO 10
Root, Neal & Company
P.O. Box 17, Station D

CHARLOTTE, N. C.
Southern Pump & Tank Co.
1730 No. Tryon St.

DENVER
Eaton Metal Prods. Co.
4800 York Street
also Albuquerque, Pueblo, Billings and Omaha

DENVER
Hendrie-Bolthoff Co.
1635 17th Street

DETROIT 26
Kerr Machinery Co.
Kerr Building

EVANSVILLE, IND.
Shrouse Machinery Co.
222 Court Bldg.

HOUSTON 1
Southern Eng. & Pump Co.
900 St. Charles St.
also Dallas, San Antonio and Kilgore

LOUISVILLE 2
Neill LaVielle Supply Co.
505 W. Main Street

MEMPHIS 2
J. E. Dilworth Co.
347 South Front St.

MINNEAPOLIS 14
Leon C. Gadbois
2524 University Ave. S. E.

NEW ORLEANS 12
Menge Pump & Mach. Co.
933 Howard Ave.

PHILADELPHIA 30
Walter H. Eagan Co.
2336-38 Fairmount Ave.

PITTSBURGH 22
Power Equipment Co.
Oliver Building

RICHMOND
O'Neill Pump & Engrg. Co.
601 E. Franklin St.

RICHMOND
Richmond Engrg. Co.
7th and Hospital Sts.

SAN FRANCISCO 19
DeLaval Pacific Co.
61 Beale St.
also Seattle and Portland

ST. LOUIS 1
Lane Machinery Co.
7th and Market Streets

TULSA 8
Warner Lewis Co.
817 North Lewis Place

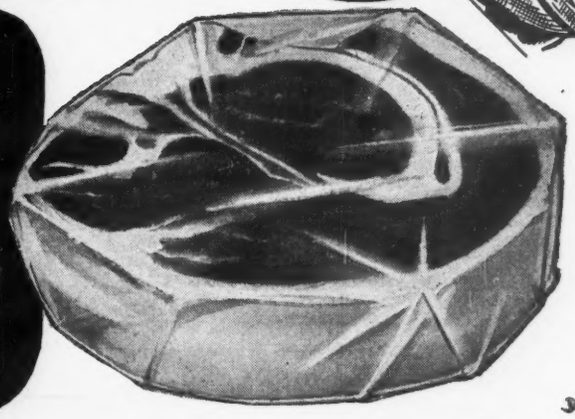
VIKING PUMPS · FIRST IN AMERICA · See Our Catalog In SWEETS

VIKING Pump COMPANY
CEDAR FALLS, IOWA

To protect kisses

... and steaks

It's SYLVANIA for Cellophane!



... and chocolate cakes!

Assured flavor and freshness! That's the secret of the growing popularity of Sylvania Cellophane. Yes, Sylvania Cellophane is a beautiful wrap, but it is also much more. This versatile packaging material guards against air, dust and moisture ... keeps the product in tip-top condition from processor to consumer!

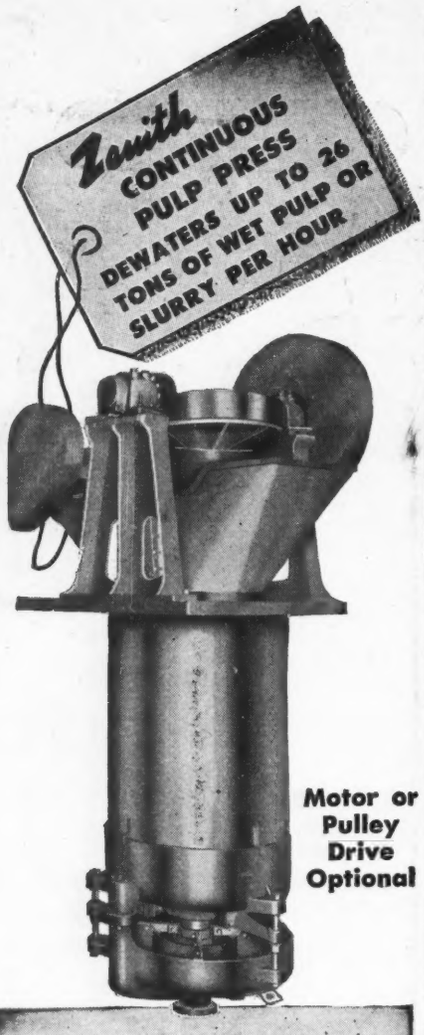
Don't overlook today's improved Sylvania Cellophane. It offers even better protection and more beauty. We hope that soon even more will be available for every requirement.

SYLVANIA CELLOPHANE

Made only by **SYLVANIA DIVISION**
AMERICAN VISCOSE CORPORATION
Manufacturers of cellophane and other cellulose products since 1929
General Sales Office: 122 E. 42nd Street, New York 17, N.Y. *Plant:* Fredericksburg, Va.

SYLVANIA CELLOPHANE

•Reg. Trade Mark

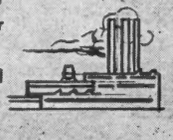


The Zenith Pulp Press, with capacity up to 26 tons per hour, thoroughly dewaters wet pulps and slurries such as:

Beet Pulp • Citrus Wastes • Tomato Pomace • Cherries • Corn Fibre • Paper Pulp • Reclaimed Rubber, etc.

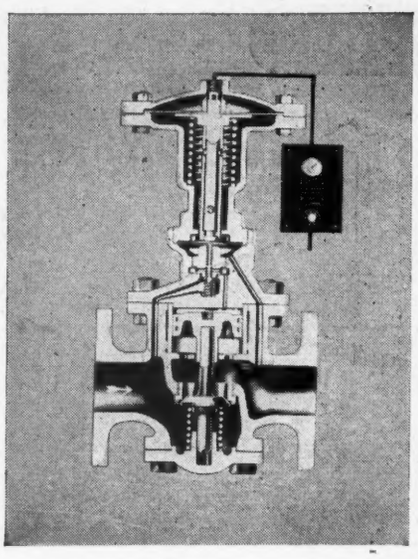
Heavy screw-type spindle applies smooth, continuous pressure, forces pulp or slurry against selective resistance. Rifle drilled resistors permit use of steam when necessary. Minutely perforated screens assure efficient drainage, hold pulp losses to minimum. Ball thrust bearings and oversize shaft bearings reduce power load.

New uses for the remarkably efficient, profitable Zenith Pulp Press are being constantly developed. An experimental press is available for trial in your plant.



Write for full information.

JACKSON & CHURCH CO.
SAGINAW, MICHIGAN



Remotely adjusted reducing valve

nent magnet surrounding the unit induces a strong magnetic field along the minor diameter of the shell, establishing it as the cathode of the gage. The anode consists of a rectangular loop of wire embracing the maximum position of the magnetic field.

These sensitive elements are shown in the foreground of the accompanying view, with the thermocouple gage at the left and the discharge gage at the right.

Regulating Valve

A SINGLE-SEATED internal pilot piston operated reducing valve designed to be remotely adjusted from a conveniently located air loading panel is announced by Leslie Co., Dept. I, 89 Delafield Ave., Lynhurst, N. J. This unit known as "Class LT-3" is especially adaptable to process piping arrangements that require readjustments of inaccessibly located valves to meet changing conditions.

Electronic Heater

EXPERIMENTAL work is facilitated by a new electronic heating generator known as Ther-Monic M 285C, now being offered by the Induction Heating Corp., Dept. I, 389 Lafayette St., New York 3, N. Y. The unusual feature of this generator is that it is suitable for providing heat either by the dielectric method or by the induction method. The generator is provided with two separate, interchangeable oscillator sections to permit the two types of heating, changeover from one section to the other being a simple job which is accomplished by removing one oscillator section and replacing it with the other.

The unit operates on 205-245 volts, single-phase a.c., and has a full load input of 12kva. At 90 percent power factor, its full load output is 285 B.t.u. per min. or approximately 5 kw. at nominal frequencies of 375,000 cycles per second for induction heat-

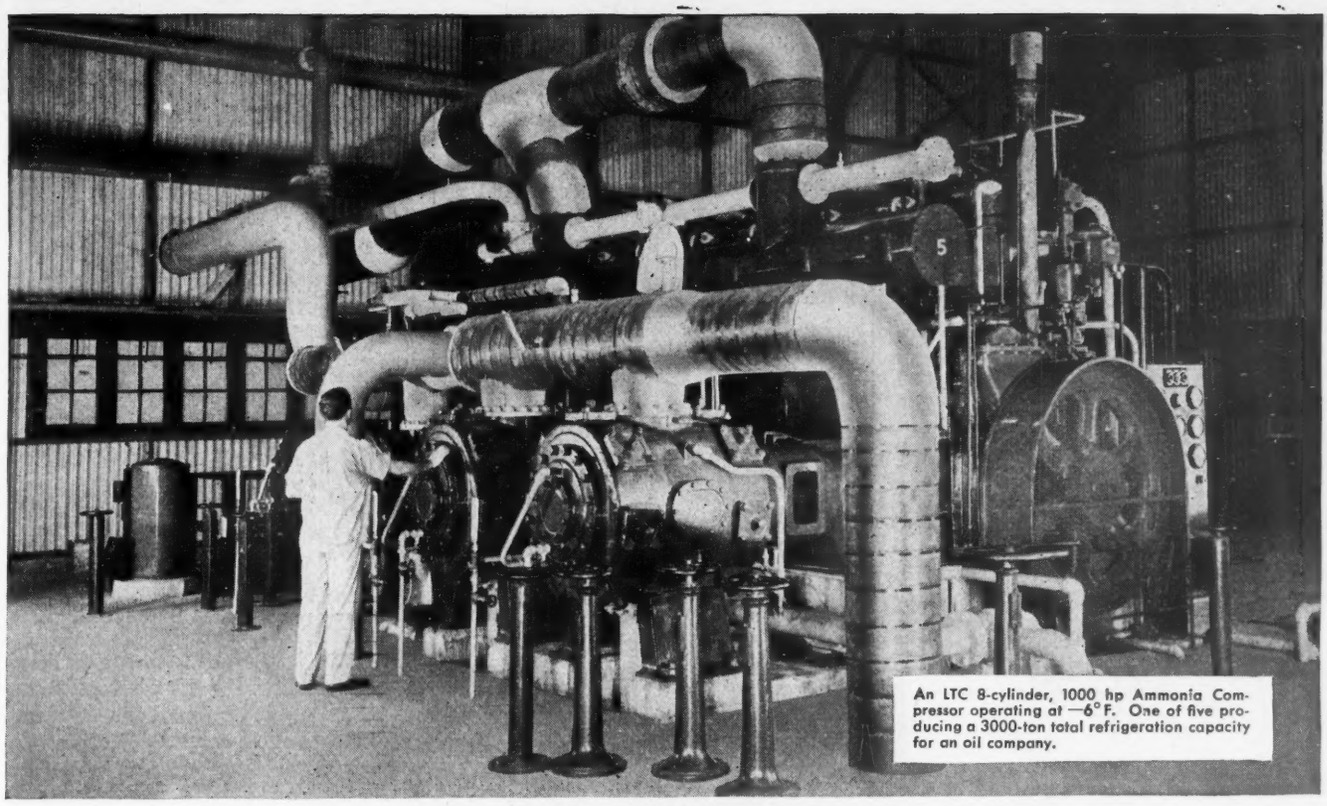
FERRY CONTINUOUS POTATO CHIP MACHINE

is completely automatic!

Automatic from raw, unpeeled potatoes to finished product. Peeling, slicing, washing, drying, frying and salting . . . all are under perfect control. You can't beat a Ferry Potato Chip Machine.

Also makers of
SLICERS AND AUTOMATIC SLICERS, FEEDERS AND CAN WASHING MACHINERY

J. D. FERRY CO.
129 SO. CAMERON ST.
HARRISBURG, PA.



An LTC 8-cylinder, 1000 hp Ammonia Compressor operating at —6° F. One of five producing a 3000-ton total refrigeration capacity for an oil company.

It's a Safe Bet You'll Find the Compressors for Your Refrigeration Job

. . . IN THIS MOST COMPLETE LINE OF ANGLE GAS-ENGINE COMPRESSORS

Whether or not your refrigeration involves special requirements — small floor space, for example — it's a safe bet you'll find exactly the angle gas-engine compressor you're looking for in the complete Worthington line.

That's because Worthington offers you more sizes and larger sizes— five of them, in fact, with from three to eight cylinders, brake horsepower from 400 to 1000 and capacities up to 1000 tons. With this wide range to choose from, and Worthington performance to depend upon, your way to better, more economical refrigeration is clear.

FEATURES THAT ADD UP

Worthington Angle Compressors are ruggedly built, down to the smallest detail. There's plenty of reserve power in their conservative rating. There's long, trouble-free service in their smooth operating balance . . . over-all accessibility . . . full force-feed lubrication of running gear . . . extensive water jacket area for power cylinders . . . and extra large diameter crankshaft which assures stiffness and provides large diameter bearings and pins for the running gear.

PLUS "EASY BREATHING"

For smoother, steadier operation under all service conditions, there's nothing in compressor design to equal Worthington's exclusive Feather* Valve. This extremely quiet, easily controlled feature enables maximum flexibility in arranging the compressor element to deliver any combination of volume and pressure within the machine's rating.

IN MAKING YOUR CHOICE

Consider these many advantages, together with great flexibility of operation, compact, space-saving design and low installation cost. They explain why Worthington Angle Gas-Engine Compressors are preferred refrigeration equipment in so many industries . . . further proof that *there's more worth in Worthington*. For complete details, write to *Worthington Pump and Machinery Corporation, Harrison, N. J.*

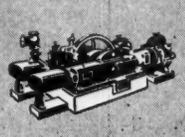
*Reg. U. S. Pat. Off.

WORTHINGTON

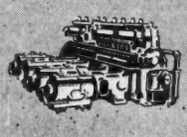
A5-21

FIVE MORE REASONS WHY WORTHINGTON LEADS IN INDUSTRIAL REFRIGERATION

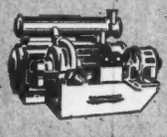
Horizontal compressors for all types of refrigerants



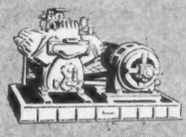
Angle gas engine compressors



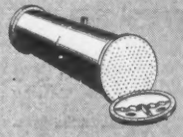
Centrifugal compressors



Compressors for Low Pressure Refrigerants



Shell and tube refrigerating equipment



New K-20
SINGLE SEATED
VALVES

UNSURPASSED

For Remote Control of
Air, Water, Gas, Light Oil,
Refrigerants—
any Voltage, A.C. or D.C.

A wide range of domestic and industrial applications, listed as standard by Underwriters' Lab. F.M. Extremely practical and simple in design. Packless construction. Positive control. Any voltage A.C. or D.C. No hum. Two wire, current failure. Coils removable while valve under pressure. Body high-grade brass forging. All internal parts bronze or stainless steel.

For complete specifications on these and other controls in the broad General Controls line, write for the new 1946 catalog 52C.

GENERAL CONTROLS
801 ALLEN AVENUE GLENDALE 1, CALIF.

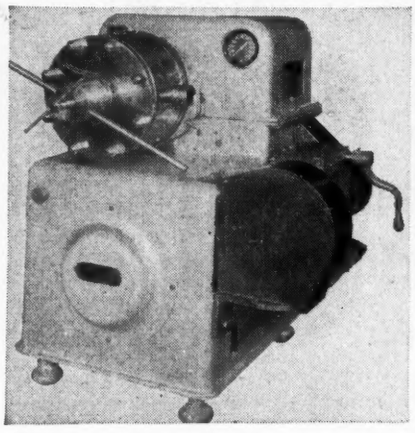
FACTORY BRANCHES: PHILADELPHIA • ATLANTA
BOSTON • CHICAGO • KANSAS CITY • NEW YORK
DALLAS • DENVER • DETROIT • CLEVELAND • HOUSTON • SAN FRANCISCO • SEATTLE • PITTSBURGH
DISTRIBUTORS IN PRINCIPAL CITIES

1-3

ing and 20,000,000 cycles per second for dielectric heating operations. When operating as a dielectric unit, the device heats non-conducting materials whereas, used as an induction unit, it heats conductors such as metals. Weight of the generator is 1,400 lb. and its dimensions are 36 x 28 x 62⅛ in. high.

Homogenizer

THE MARCO CO., Dept. I, Wilmington, Del., announce the KAC Model FLOW-MASTER Kom-bi-nator in 200, 500 and 1,000 g.p.h. capacities. It is used for producing creamy peanut butter and mustard. The peanut butter, leaving the standard grinding mill, is drawn into the Kom-bi-nator under vacuum of a pump which is an integral part of the machine. It is then forced forward under pressure between and through a series of rotors and stator plates, which provide reduction to as small as one micron.



KAC Model Flow-Master Kom-bi-nator.

Processing of peanut butter is accomplished at less than 25 psi. In processing mustard, four Kom-bi-nators in series will produce up to 500 g.p.h.

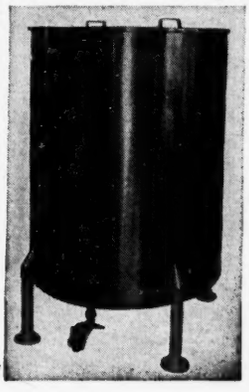
The KAC Kom-bi-nators can be furnished with a variable speed drive having infinite speed ranges from 100 to 900 r.p.m. Thus, the equipment can be synchronized easily with existing conveying and packing equipment.

Electrofluid Drive

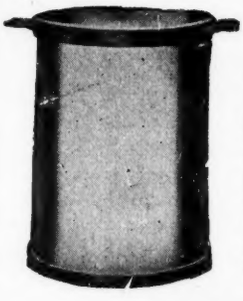
A NEW type of "packaged" power unit, to be known as electrofluid drive, has been announced by Link-Belt Co., Dept. I, 307 N. Michigan Ave., Chicago 1, Ill. It is a neat, compact, motorized hydraulic combination consisting of a general-purpose a.c. induction motor flange-mounted on a sturdy housing containing a hydraulic coupling. Its output shaft may be direct-connected to the driven machine, or to a speed reducer unit.

Without need of any complicated starting control or special type of motor, this drive has solved the problem of inadequate torque and excessive high starting current peaks. Regardless of the characteristics of driven

TERRISS
SEAMLESS, STAINLESS
STEELWARE



TANKS: 18-8 Stainless Steel. Highly polished No. 4 finish inside and out. Pitched bottom, self-draining. Stainless Steel covers. Stands pipe leg type. Built-in agitators for fast or slow speed, if desired. 25, 35, 50, 60, 100, 160, 200, 300, 400 and 500 gallons sizes . . . also built to special specifications.



BATCH CANS

Monel metal or stainless steel. Endless iron ring, handles attached, reinforces top. Bottom reinforced by iron cross welded to iron chime. 10 to 75 gallons.

DIPPERS

72 oz. with 17" hooked handle. Also some one, two and four-quart FLAT dippers.

PAILS

Seamless stainless steel. Capacities, 12 and 15½ quarts.

We carry a full line of Filter Paper. Also, Hose for all purposes. Send us a sample of your needs.

Immediate Delivery

CONSOLIDATED
SIPHON SUPPLY CO., INC.
DEPT F, 22-24 WOOSTER ST., NEW YORK CITY

EMBODY THESE 5 COST-CUTTING CHARACTERISTICS

1 **EXTREME FLEXIBILITY**—Wissco Belts will operate over small diameter pulleys, insuring economy of design.

2 **OPEN WEAVE CONSTRUCTION**—Permitting free air circulation; free drainage.

3 **SIMPLICITY OF DESIGN**—Easily made endless. Readily repaired in case of accidental damage.

4 **ADAPTABILITY**—Built to withstand corrosion, abrasion, brazing temperatures.

5 **MINIMUM OPERATING COSTS**—Greatest load carrying capacity per unit of weight and low thermal capacity means fuel economy.

Send for our profusely illustrated catalog showing types and advantages of numerous conveyor belt constructions.

Wissco Metal Conveyor Belts Are Being Used In

•

Annealing Ovens
Baking Ovens
Brazing Furnaces
Chemical Processing
Decorating Glass
Ceramic Products
Canning
Dehydrating Food
Degreasing
Frozen Foods
Hardening Furnaces
Infra-Red Drying
Reclaiming Tin, etc.

•

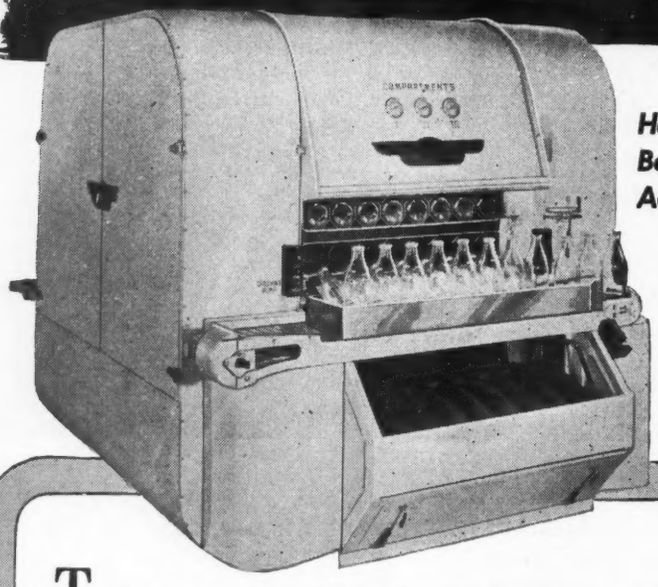
WISSCO METAL CONVEYOR BELTS

A PRODUCT OF WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

CF&I

Sales Office and Plant—52 Sterling St., Clinton, Mass. *General Sales Office*—361 Delaware Ave., Buffalo 2, N.Y.
District Offices: Boston, Chicago, Denver, New York. The California Wire Cloth Corporation, Oakland 6, Calif.

THE
VIKING BOTTLE CLEANER
Offers You SIMPLICITY, EFFICIENCY, ECONOMY



Handles Square Bottles Without Adjustment, Too

The few parts of the Viking bottle cleaner are rugged and long lived, assuring maximum economy of operation with a minimum of maintenance expense. Its design is as simple as Barry-Wehmiller ingenuity, experience and advanced engineering can produce.

A long submerged soaking period, plus high hydro-washing pressure after soaking, makes the Viking a true marvel of efficiency in delivering sparklingly clean bottles. Because of its simple, rugged design, the new square milk bottles can be handled without any mechanical adjustments.

Designed with capacities from 20 to 90 bottles per minute, plus the cleaning action that assures positive bottle sterility, the Viking is an outstanding value in its field.

Write today for details of the Viking to meet your individual requirements

BARRY-WEHMILLER MACHINERY CO.

1946 . . . Our 61st Anniversary • St. Louis, Mo., U.S.A.

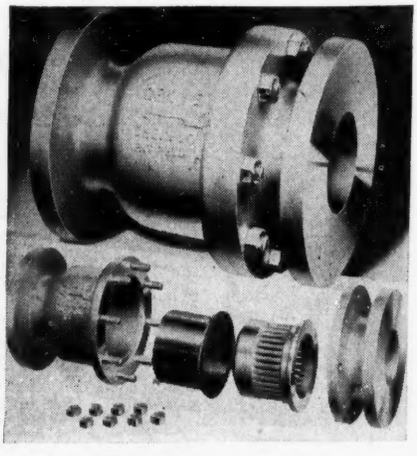
machine or connected load, the motor starts at no load, because at zero speed the torque transmitting capacity of the fluid coupling is zero. The motor accelerates quickly, developing torque in the fluid coupling in the ratio of the square of the speed, until sufficient torque up to the maximum running torque of the motor is developed to start the driven load.

Unit Demineralizers

A SERIES of four package-type unit demineralizers to provide industrially pure water at low cost compared with distillation has been announced by Cochrane Corp., Dept. I, 17th St. and Allegheny Ave., Philadelphia 32, Pa. These units, which are intended for relatively small-capacity applications, employ reaction tanks of 12, 18, 24 and 36 in. diameter. Units consist of two vertical reaction vessels, one an exchanger and the other an adsorber, mounted on a frame so that a double-compartment acid and alkali tank for regeneration chemicals is between the exchanger and adsorber. Above these latter tanks is the control panel, behind which is all necessary piping. The control panel is designed for simplified control of backwashing, regeneration, rinsing and treating stages. It includes a conductivity meter, pressure gage, flowmeter and the necessary electric switches and valves. Various reaction materials are available, the particular type used depending on the requirements for any particular raw water supply. The new demineralizers are designated as Model CDM.

Check Valve

A CHECK valve known as the "Chexflo" valve, whose operation is effected by a synthetic rubber tube stretched over a slotted cup-shaped metal core, which expands to open and contracts to close is announced by Grove Regulator Co., Dept. I., 6417 Green St., Oakland 8, Calif. Due to the fact that this expansible tube closes instantly on balanced flow, prior to the commencement of back flow, there is never any tendency to establish pres-



"Chexflo" check valve

WALWORTH

Pressure-Seal Valves

The greatest improvement in high-pressure, high-temperature valve design

WHY?

Because the fundamental principle of the design of the Walworth Pressure-Seal Valve is such that the internal pressure makes the body-to-bonnet joint tight. This tightness extends over the range of all practical conditions, including "carry-over", sudden changes of temperature, and sudden changes of pressure.

The body-to-bonnet joint is easily disassembled and assembled in a minimum of time, reducing the period the pipe line is out of service.

Valve maintenance is reduced to a minimum.

These valves have a semi-flexible disc which compensates for changes in the body shape due to temperature and pressure variations.

An improved guide extends over the entire travel of the disc, making the Walworth Pressure-Seal Valve easier to open and close.

Valve ports and guides are designed to give streamline flow.

The strength of Walworth Pressure-Seal Valves is greater than that of previous designs, even though the weight is reduced approximately 50 per cent.

Walworth Pressure-Seal Valves are now available in the following sizes: Series 900 — 3" and larger; Series 1500 — 1" and larger.

LOOK AT THESE ADVANTAGES

1. BONNET TIGHTNESS
2. NO BONNET BOLTS OR WELDS
3. IMPROVED YOKE DESIGN
4. EASILY AND QUICKLY ASSEMBLED
5. EASILY AND QUICKLY DISASSEMBLED
6. DISC TIGHTNESS
7. IMPROVED GUIDE
8. STREAMLINE FLOW DESIGN
9. EASY TO CLOSE
10. EASY TO OPEN
11. VALVE STRONGER
12. WEIGHT REDUCED
13. SPACE REDUCED

WALWORTH

valves and fittings

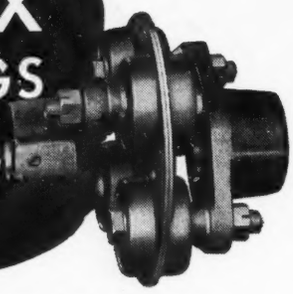
60 EAST 42nd ST., NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

Give them a

"white glove inspection"

MORFLEX COUPLINGS *stay clean*



Where cleanliness is essential, Morflex couplings are the answer. Require absolutely no lubrication—no oil or grease to throw off and soil or contaminate products. Specially designed rubber trunnion biscuits absorb shock, isolate vibration, smooth operation. Sizes from 2" to 12" diameter, for various capacities.

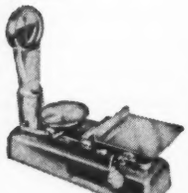
MORSE CHAIN CO. • Detroit 8, Mich. • Ithaca, N.Y.

A Borg-Warner Industry

MORSE COUPLINGS and DRIVE SHAFTS

DETECTO SCALES

There's a precision-accurate Detecto Scale for your specific weighing and counting need. The Detecto helps increase production, yet assures you maximum accuracy by making slightest weight discrepancies immediately visible.



DETECTO ALUMINUM SPEED SCALE.

For increased production at lower cost! One operator with one Speed Scale does as much as two operators with ordinary scales. Sturdy, precision built, super-accurate. Ends overweight losses.

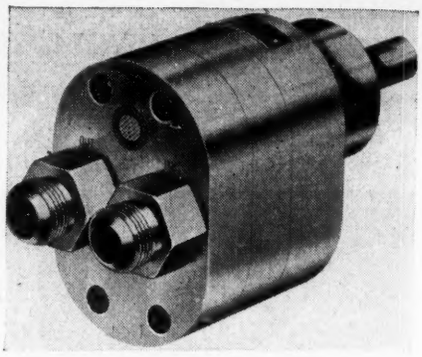
Write for circular.

DETECTO • SCALES • INC.

MAKERS OF FINE SCALES SINCE 1900

1012 MAIN STREET • BROOKLYN 1, N. Y.

SCALE ENGINEERS IN ALL PRINCIPAL CITIES



High Pressure Gear Pump

sure impulses, shock or water hammer through the flow line. The flexive tube possesses a uniform and constant spring rate which avoids inertia being set up to cause operation beyond flow requirements. It likewise improves in service, due to the fact that "flexing" adds life to rubber. The unit is particularly suited for handling even highly corrosive liquids and gases.

High Pressure Pump

APPLICATIONS such as power transmission and materials handling, requiring small fluid displacement capacities at high pressure, are the field for the Series 700 pump recently announced by the McIntyre Co., Dept. I, Newton, Mass. This is a direct-driven spur-gear pump said to have a volumetric efficiency in excess of 90 percent and a mechanical efficiency in excess of 80 percent. Four models are available, displacing from 0.4 to 9.6 g.p.m. at speeds ranging up to 1,750 r.p.m., against working pressures up to 1,000 psi. Power requirements range from fractional to 6½ hp. The pump body is constructed of aluminum with nitrided Nitraloy gears.

Electronic Seamer

MACHINES for electronic seaming of thermoplastic film materials, such as vinylite, pliofilm, koroseal, saran, and others, have been developed by Union Special Machine Co., Dept. I, 450 N. Franklin St., Chicago, Ill. The machine is equipped with an RCA 200 megacycle constant frequency power generator. Power is supplied to rotary type electrodes at the seaming head. The machine has sufficient power to seal ten thicknesses of 0.004 in. vinyl film, or two thicknesses of 0.020 in film. Power is taken from an ordinary 110-120 volt, single phase, 60 cycle a.c. line capable of supplying 13 amperes. The controls include a conventional treadle connected to a ⅓ hp. clutch-type motor, which drives the seaming head. The same treadle also controls the On-Off switch for high frequency power to electrodes. Seam widths ranging from 1/16 to ¼ in. may be obtained by changing the top electrode. The distinctive feature of this machine is its ability to produce the fused seam in a silent, continuous operation.

CATALOGS, BULLETINS

This digest of manufacturers' new publications is offered for FOOD INDUSTRIES Readers' Service as a convenience for executives. To obtain this literature, fill in the coupon, clip to your letterhead, and mail to FOOD INDUSTRIES.

Food Plant Equipment

Batch Cooking System 1
Selas Corp. of America—Bulletin No. 333-F. 12-page illustrated bulletin describing the Selas system for batch cooking. It includes sectional and schematic drawings, tables, operating principles, applications, characteristics and advantages of this company's developments in the field of batch cooking. Includes data and information on the various individual components of the system.

Process Equipment 2
Industrial Process Engineers—8-page booklet describing the services available from this company as well as processing equipment manufactured. Kettles, stills, autoclaves, mixers and auxiliary equipment are illustrated and briefly described.

Fin Coils 3
Rempe Company—20 page catalog No. 120 on fin coils and custom built air conditioning units for low temperature cooling. It contains concise and clear tables and other refrigeration data for refrigeration engineers dealing with walk-in coolers, display cases, and air conditioning.

Industrial Burners 4
York-Shipley, Inc.—12-page bulletin ID-4-6H, entitled "Precision Combustion", centers around the company's three exclusive features which are the flame former, Iris shutter and tear drop valve, and the automatic torch lighter. The catalog also illustrates the different types of boilers with which the unit may be used and includes two typical oil piping diagrams.

Dust Collector 5
Pangborn Corporation—Bulletin No. 909A, 30 pages, describes the principle of the Pangborn dust control system and its applications in the food industries. Bulletin No. 910, 4 pages, describes and illustrates type "CK" unit industrial dust collector.

Condensate Filter 6
Davis Filtration Equipment Co. Inc.—8-page bulletin describing and illustrating a filter for purifying contaminated condensate. Uniform size filter leaves are arranged vertically, in parallel, on a movable rack inclosed in a horizontal cylinder with a specially built quick-lock, pressure-tight door.

Valve Unit 7
Durable Mfg. Company—Catalog No. 920 entitled "Pump Valve Service" illustrates a wide range of application of durable valve units for reciprocating pumps and diesel engines. In addition to presenting design characteristics of the valves, their adaptability for use as replacement units on any type of reciprocating pump is indicated.

Electrical Products 8
Electrical products for a wide variety of industries are described in a well-illustrated, letter-size, 16-page handbook, B6452, announced by Allis Chalmers Mfg. Co. Eight classifications of electrical equipment are described ranging from ac and dc motors of ½ to 50,000 hp. to electronic heaters. Motor control equipment, multiple V-belt drives of constant and variable speeds, low and high voltage transformers, switchboards, switchgear and circuit breakers, equipment for power generation and centrifugal pumps, are also graphically described.

Pumps 9
Economy Pumps, Inc.—Catalog D-446 covering Type ES, small, high pressure pumps, for pressures up to 200 lb. p.s.i. Standard vertical ball bearing motors are used.

Heating Jackets 10
Scientific Glass Apparatus Company—Bulletin C-100-946. Describes and illustrates the Gyco heating jacket and the pyro-tran. The heating jacket used in laboratory work is constructed of highly insulating Fiberglas cloth and layers of Fiberglas wool with the heating element woven into a snake-like coil which is sewn with glass yarn in spiral fashion directly to the inner surface of the jacket.

Water Treating 11
The Permutit Co.—New booklet describes basic types of ion exchange water softeners for industrial, institutional and municipal use. Softeners are of both pressure and gravity types which feature automatic equipment to control backwashing, brining and rinsing processes.

Duplex Tubing 12
Bridgeport Brass Co.—10-page Bulletin No. 746 on Duplex Tubing. Where a condition exists that tubing is attacked simultaneously inside and outside by two different types of corrosive media, it presents a problem in corrosion which Duplex tubing can solve. The bulletin describes various combinations of materials to meet various conditions in industry.

Blowers 13
Roots Connersville Blower Corp.—Bulletin 120-V-13 is an 8-page folder illustrating the centrifugal blowers and exhausters available for a wide range of applications.

Boiler Condensate 14
Cochrane Corp.—Publication No. 3250 describing their system of returning condensate to boilers at high pressure and at high temperature.

Flexible Couplings 15
The American Flexible Coupling Co. Division of J. A. Zurn Mfg. Co.—A 34-page catalog No. 461 describing and illustrating flexible couplings. The construction and various physical characteristics of the various types of couplings this company manufactures are treated in detail.

Electric Motors 16
Electric Machinery Mfg. Co.—20-page booklet entitled "The ABC of Synchronous Motor Control." Contains a large number of diagrams and photographs to illustrate the various principles of operation.

Regulators 17
Pittsburgh Equitable Meter Division, Rockwell Mfg. Co.—Bulletin 1136. 12-page booklet illustrating and describing gas appliance regulators with pressure cast aluminum alloy cases. Features of this regulator are illustrated schematically, and some applications are described.

Pumps 18
Peerless Pump Division, Food Machinery Corp.—6-page leaflet describes the design, construction and application of three types of Peerless vertical centrifugal pumps for general purpose pumping in a variety of industrial services such as sump and drainage pumping, general water supply, mine station service, cooling tower service, etc. Sectional drawings show the various parts in detail.

Dust Collector 19
American Air Filter Co., Inc.—Bulletin 253.—16-page illustrated booklet describing the Electro-Airmat Model A electronic precipitator manufactured by this company. The principle of operation of this dry type precipitator is explained and illustrated with diagrammatic sketches. Includes data on installation, maintenance, efficiency and voltage requirements.

Sight Glasses 20
Bijur Lubricating Corp.—Bulletin 4-B. 4-page folder illustrating and describing the sight glasses or windows for observing operation of internal moving parts, or for observing the liquid level or flow of fluids in industrial equipment.

Bag Sealer 21
Saranac Machine Co.—Bulletin No. 154 gives specifications and other information on standard Model D bag sealing machine. Operation instructions for typical products that can be handled with the machine are given.

Heat Exchangers 22
The Patterson-Kelley Co. Inc.—12-page booklet illustrates and describes the Freon water coolers for air conditioning and refrigeration equipment. Dry expansion water coolers using Freon are discussed and standard construction specifications are given. Includes diagrammatic layouts

Good until March, 1947

FOOD INDUSTRIES READERS' SERVICE

FOOD INDUSTRIES, 330 W. 42nd St., New York City 18

Please have manufacturer send me, without obligation, literature circled below.

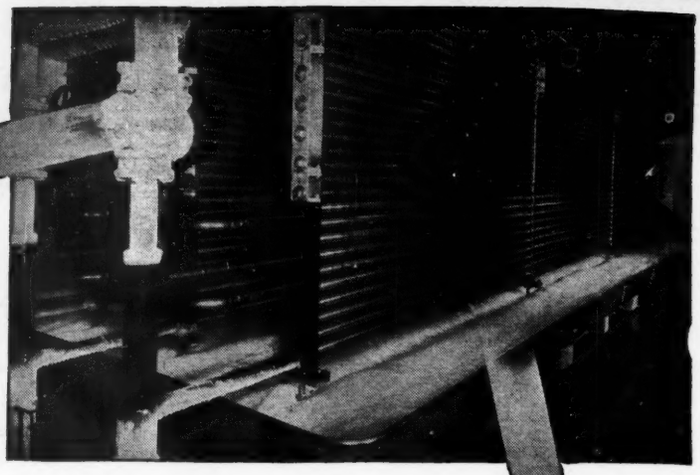
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43											

NAME..... TITLE.....

FIRM OR AFFILIATION.....

ADDRESS.....

12-46



SAFEGUARD *Purity*

of food or process products
...rely on
GLOBE STAINLESS STEEL TUBES

In dairy, meat packing, canning, and other food processing plants — in textile, sugar, soap, tanning, pulp and paper, petroleum refining, and chemical industries — Globe Stainless Steel Tubes are in wide use, protecting against corrosion and product contamination. Globe Stainless Steel Tubes are highly resistant to wet corrosion, dry corrosion, scaling or breakdowns at high temperatures. Where service conditions are severe, specify Globe Stainless Steel Tubes — available in both Seamless and Welded types, in a wide range of sizes and analyses of Chrome and Chrome-Nickel Alloys.

Globe Engineers will assist in selecting the proper analysis for any given situation.

3008

GLOBE

GLOBE TUBES

- ★ Pressure Tubes
- ★ Condenser & Heat Exchanger Tubes
- ★ Seamless Stainless Steel Tubes
- ★ Mechanical Tubing
- ★ Gloweld Welded Stainless Steel Tubes
- ★ Globeiron High Purity Iron Seamless Tubes

STEEL TUBES CO. *Milwaukee 4, Wisconsin, U.S.A.*

or arrangements of the piping and control arrangement of this cooler in various applications. Detailed instructions for selecting the right size of water cooler are given and a 2-page cooler selection data chart in color is shown. Pertinent engineering data is given in tabular form.

Ventilating Equipment 23
The Propeller Fan Manufacturers Association—New bulletin prepared by the Engineering Committee of this association which sets forth the basic requirements of satisfactory attic ventilation. This booklet entitled "Attic Ventilation Code," should be helpful in planning the ventilation of buildings.

Dust Collector 24
The Aerotec Company—Bulletin No. 310 on an integral dust collector. It is a "packaged" unit, complete with motor and fan and is available in ratings from 300 cfm to 2100 cfm.

Boiler 25
Henry Vogt Machine Co.—14-page booklet illustrating a number of applications of the Class VL bent tube boiler made by this company. Details of construction and installation are shown in diagrammatic sketches.

Compressors and Specialties..... 26
Worthington Pump & Machinery Corp.—Bulletin L-640-B1A describing single horizontal compressors. Bulletin W-350-B5A covering valves, pipe, flanges and other specialties.

Plug Valve 27
American Car & Foundry Company—8-page bulletin on full pipe-area lubricated plug valves for acids, caustics, or water and other fluids.

Plant Supplies

Cleaning Compound 28
Oakite Products, Inc.—Leaflet describing mass production method for cleaning and derusting beef, sheep and hog trolleys in meat plants.

Guar 29
General Mills Inc. has published a 16-page booklet entitled "The Story of Guar," which includes data on the production of guar flour and its various uses in industry.

Protective Coating 30
The Merchants Chemical Co.—4-page bulletin describing Cordo-Clad 1060, which is a plastic base solvent type air drying protective coating. Includes data on properties, application methods, and lists a number of coats which must be applied to resist various chemical substances.

Rubber Products 31
B. F. Goodrich Co.—Several bulletins are now available from this company on the following subjects: Power transmission belting, cleaning and storing of conveyor belts, Flexseal hose joints, electrically heated rubber, industrial fire protection.

Cleaning Compounds 32
Phillips Chemicals Co.—Handbook entitled "Production and Maintenance Cleaning," which gives information on proper methods and components for use in various types of production line as well as maintenance cleaning.

Chemicals 33
Sharples Chemicals, Inc.—72-page booklet describing the synthetic organic chemicals manufactured by this company. This booklet lists the commercial products and some products now in semi-commercial or laboratory stage of development. Contains information on over 150 synthetic organic chemicals, including alcohols,

The WORK of a GIANT

• Within these walls a giant stands ready to work for you. Giving him no thought at all, you touch the control button. At your command his mighty muscles go into action and the load moves.

The operating mechanism of Shepard Niles hoists is completely enclosed, assuring permanent alignment—more durable, trouble-free, efficient service. Whatever your lifting or handling requirements may be, there's a Shepard Niles hoist for the job—more than 5,000 types and sizes.

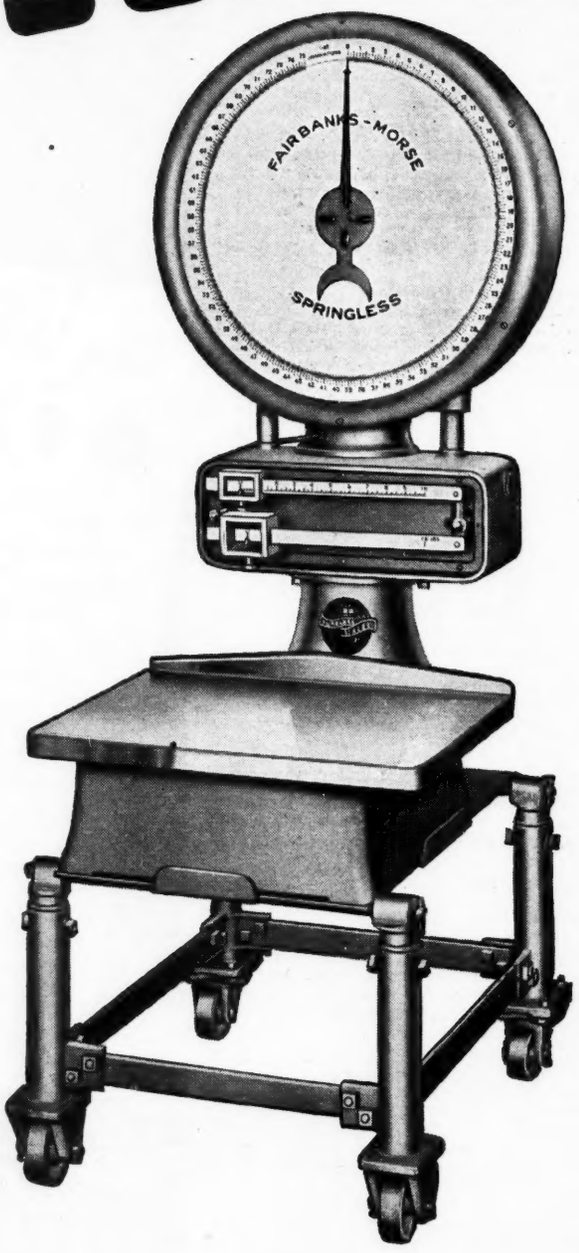
Powerful and rugged, Shepard Niles Cranes are available in any desired capacity and span—designed to handle greatly varying loads with precision, safety and economy. Shepard Niles Cranes have the same sound, progressive features as do the Shepard Niles Hoists. A request will promptly bring illustrated bulletins.

Shepard Niles
CRANE & HOIST CORPORATION

The experience and facilities of Shepard Niles engineers are at your service. Plan ahead now for the right material handling equipment. Your inquiry will receive prompt attention.

422 SCHUYLER AVENUE • MONTOUR FALLS, N. Y.

SEE FAIRBANKS-MORSE FIRST FOR SCALES



TO safeguard your profits, your scales must be *accurate* . . . not just when new, but for years to come . . . not just in favorable surroundings, but also where conditions are severe.

Whatever your weighing jobs, however punishing your conditions, you'll find the ideal scales in the complete Fairbanks-Morse line . . . scales which withstand moisture, brine, and other corrosive elements . . . scales which will fit into your practices and give you long years of swift, accurate weighing service.

Let a Fairbanks-Morse scale engineer help you select the models that will serve you best. Fairbanks, Morse & Co., Chicago 5, Illinois.

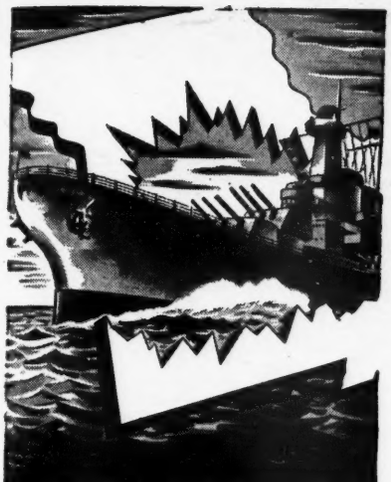
* * *

Moisture can't harm the dial head and beam lever housing in this Fairbanks-Morse Butter-Packing Scale, because they are tightly sealed. All vital working parts are made of durable, rust-proof stainless steel. Model shown is mounted on adjustable stand.

Fairbanks-Morse

A name worth remembering

Diesel Locomotives • Diesel Engines
Scales • Motors • Pumps • Generators
Magnetos • Stokers • Railroad Motor Cars and Standpipes • Farm Equipment



MIGHTY MISSOURI

A mighty warship steams across the oceans of the world . . . the U.S.S. MISSOURI. And the name she bears so gallantly is an appropriate one, for the heritage of the state of Missouri is progress.

The men who are captains of industry recognize these advantages native to Missouri:

- Low taxes
- 2,251 new corporations first nine months of 1946
- Skilled native labor
- Excellent transportation facilities
- Rich markets
- Wealth of natural resources
- Low cost power
- 350 communities eager to cooperate

Whether you're planning a parent plant or branch factory, let the "show me" state show you its full resources.

Specialized, confidential service to industrialists. Write direct: Missouri State Division of Resources & Development, Dept. N60, Jefferson City, Mo.

THE STATE OF MISSOURI

In The Heart of America

alkyl chlorides, substituted amides, amines, dithiocarbamis acid derivatives, ethers, esters, hydrocarbons, mercaptans, organic sulphides, phenols and substituted ureas.

Floor Coating 34

Truscon Laboratories, Inc.—Book B. New specification book describes the floor treating compounds made by this company. It covers such subjects as wood floor preservatives, surface coatings with a wood rubber base, concrete dyes and other materials for covering floors.

Water Treating 35

Water Service Laboratories have prepared a 4-page leaflet featuring the boiler cleaning service of this company for internal cleaning of heating boilers.

Filter Aids 36

The Dicalite Co.—Bulletin No. B-11. 16-page booklet describing industrial filtration with Dicalite filter aids. Principle of filtration using filter aids is discussed in detail. Photomicrographs illustrate the types of diatoms found in Dicalite filter aids. A typical filter system using this material is shown in schematic form. A number of applications are listed. Bulletin S-51 describes the use of filter aids in the manufacture of paper products.

Miscellaneous

Conveyors 37

Speedways Conveyors, Inc. — 2-page leaflet featuring the Speed-Lift belt conveyor, which is adjustable, reversible, and portable. Specifications, sizes and capacities are included.

Materials Handling 38

Jeffrey Mfg. Co.—Catalog 791. 32-page catalog illustrating and describing the materials handling and process equipment manufactured by this company. Includes information on vibrating feeders, weigh feeders, rotary bins, check valves, bin level indicators, mechanical feeders, reduction machinery, screens, magnetic separators, elevating machinery, conveyors, and other equipment. Also 6-page folder featuring the Bin Eye Indicator for positive accurate control of bin level.

Floor Trucks 39

The Rapids-Standard Co., Inc.—A two-color, 4-page bulletin No. TR-NSP-4 featuring modern floor trucks. Detailed specifications and illustrations are contained in the bulletin. Capacities of various models, construction details, and selling prices are all given.

Floor Machine 40

G. H. Tennant Co.—Bulletin 81.9 illustrates and describes model 15 disc type floor machine for polishing, scrubbing, steel wooling and similar functions.

Boiler Tubes 41

Jos. T. Ryerson & Son, Inc.—8-page illustrated booklet featuring the Babcock & Wilcox electric resistance welded boiler tubes now distributed by this company.

Engineering Facilities 42

Lukenweld, Inc.—A 28-page bulletin describing the engineering facilities for designing and fabricating mediums it offers. Its shop equipment, capable of producing predictable structures, both in pilot models and production runs, is shown.

Concrete Shrinkage 43

The Master Builders Company—34-page booklet entitled "The Action of Embeco in Concrete and Mortar." This booklet explains the principle of specially prepared metallic aggregate in controlling shrinkage. Contains charts, graphs and useful technical data. Discusses the general theory of shrinkage, factors affecting shrinkage, flocculation or dispersion of the cement, and other similar information.

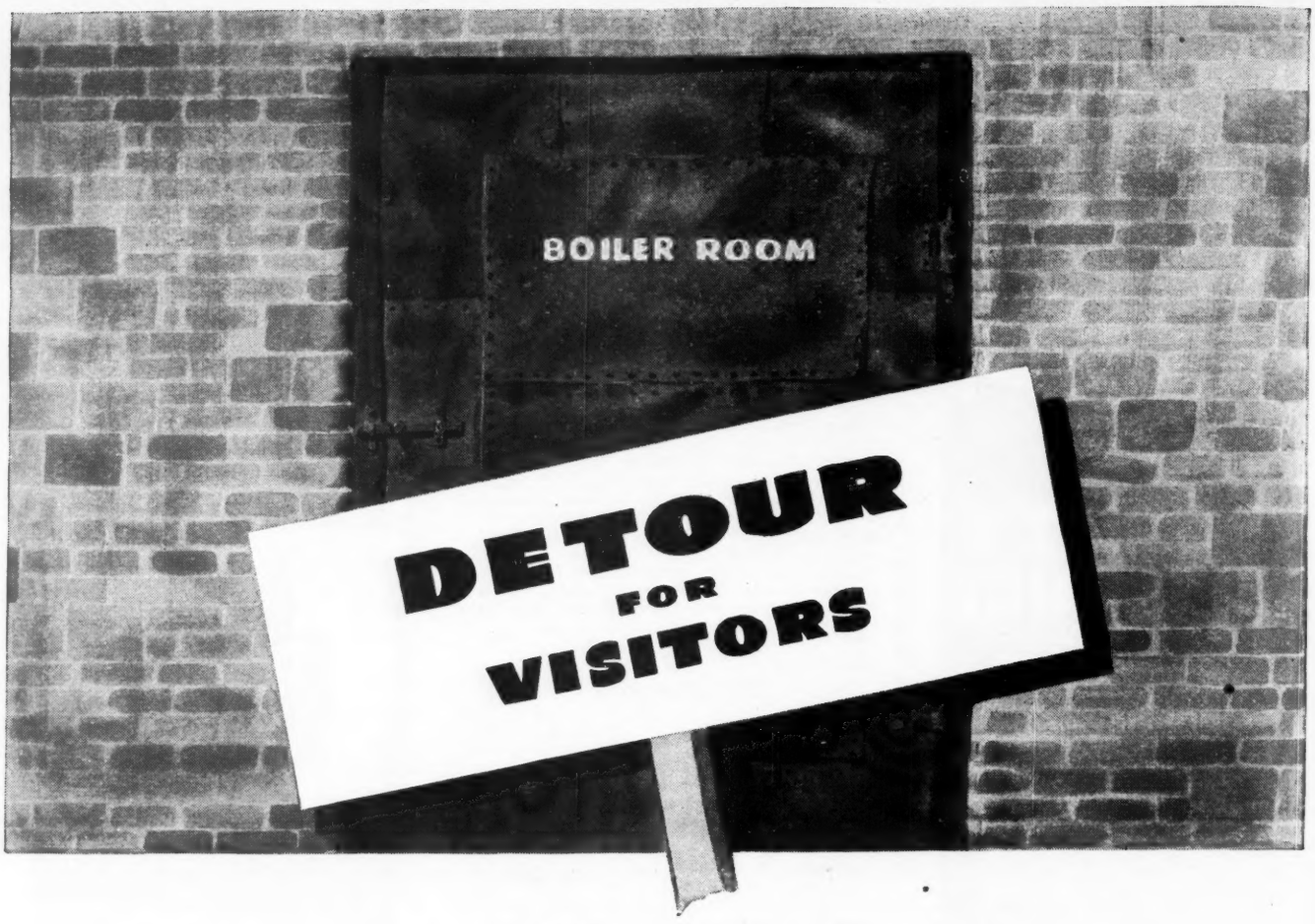
The PROOF of the COOKING IS HERE

COOK-CHEX retort tags provide positive protection against uncooked materials. On every batch, a tag if *purple* warns: "Uncooked." But a *green* tag means: "Cooked." And you can depend on its unfailing accuracy.

ATI COOK-CHEX tags prevent spoilage, waste and possible embarrassment for less than 1/50¢ per case. They react only to moist heat, such as pure steam or superheated water. Their definite change in color is easily checked. Each tag serves as a permanent processing record. ATI COOK-CHEX will fit easily into your present procedure. Send in a trial order now. $9.75 per M.

THIS METAL CONTAINER is a practical, sturdy holder for Cook-Chex tags. Write for FREE sample holder and tags," with complete facts and directions.

ATI COOK-CHEX
MANUFACTURED BY
ASEPTIC-THERMO INDICATOR CO.
4665 HOLLYWOOD BLVD. - LOS ANGELES 27



Ashamed of Your Boiler Room?

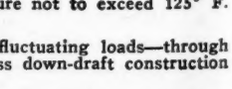
IS your boiler-room taboo for visitors? Are its appearance and condition such that you are not proud to say it's part of your plant or building?

There is a quick, sure remedy for an "eye-sore" boiler-room—replace your old steam plant with a modern, oil-fired Cleaver-Brooks steam generator. Its modern design and construction—its clean, smokeless, efficient operation (no ashes, dirt, or soot to contend with) assure a "show-place" boiler-room at all times.

CLEAVER-BROOKS CO., 327 E. Keefe Ave., Milwaukee 12, Wis.

A custom-planned, application-engineered Cleaver-Brooks Steam Generator installation has made lower fuel and steam costs a reality in scores of plants. Here are some of the reasons:

- A steam plant tailored for your job. Cleaver-Brooks analyzes your load conditions, space and equipment arrangements, future growth needs, puts unit into initial operation, instructs as to operation, care, maintenance.
- Designed for utmost convenience of operator—all controls may be operated from front of boiler. A factory engineer puts unit into initial operation, and trains your employees in operation, care, maintenance.
- One source and one responsibility for the complete generator—Cleaver-Brooks factory-finished and tested—a fully "packaged" unit meeting all code requirements.
- Fast installation. No special foundation needed. Within 24 hours after arrival, your Cleaver-Brooks Steam Generator can be in operation.
- No smoke-stack required; simple roof-high vent exhausts combustion gases.
- Saves space, uses less plant area, fits into low head-room locations.
- Oil-firing eliminates smoke, ashes, clinkers, messy boiler-room conditions.
- Low operating costs; unsurpassed guarantee: — 80% thermal efficiency; 13% CO_2 gases; stack temperature not to exceed 125° F. above standard steam temperature.
- Quick steaming—for any emergency or fluctuating loads—through high heat transfer with Cleaver-Brooks 4-pass down-draft construction and integral oil-burner.
- Full-size range is available—22 models in sizes from 15 to 500 h.p., at steam pressures from 15 to 200 lbs. p.s.i. Write for bulletin and complete information.



Cleaver-Brooks
STEAM
GENERATORS

WRITE on your business letterhead for the Free Steam Cost-Calculator — a ready-reference slide rule showing the comparative steam costs when using oil or coal as fuel.

FOOD TECHNOLOGY
NEW DISCOVERIES AND INVENTIONS

MICROBIOLOGY

Mold in Blueberries

A STRAIN of *Penicillium* that grows in a 15 in. vacuum has been found to infect No. 10 cans of blueberries. It grows in an atmosphere containing as little as 0.5 percent oxygen. Since it withstands 190 deg. F. for an hour, prevention of infections are difficult.

While this mold grows at very low oxygen tensions it is inhibited by carbon dioxide. Closure of cans in a CO_2 atmosphere could result in a very high vacuum and collapse as the CO_2 is absorbed. If nitrogen atmospheres are used, great care must be taken to see that entrapped air is removed.

The organism has been found in widely scattered regions where blueberries are grown. Washing the berries reduces the contamination but any reuse of wash water tends to spread it. Wooden boxes as well as insufficiently cleaned processing equipment were found to be sources of contamination.

Mold occurred to about the same extent in plain and enamel-lined cans. The rate of oxygen disappearance in the two types of cans is not sufficiently different to affect mold growth.

Digest from "Prevention of Mold in Kettled Blueberries in No. 10 Cans," by E. H. Ruyle, W. E. Pearce and G. L. Hays, *Food Research*, 11, 274-279, May-June, 1946.

FATS and OILS

New Antioxidants

TWO NEW groups of antioxidants are proposed which, it is claimed, exert even in minute amounts a distinctive stabilizing effect on fats and oils. These chemically related groups of organic sulphur compounds are the thio-polycarboxylic acids, among which, as the preferred rancidity inhibitor, beta-beta-thio-dipropionic acid is named, and the substituted mercapto-carboxylic acids, represented by the 3-ethyl-mercapto-propionic acids.

The surprising and unexpected effect of these substances, which can be observed by adding as little as 0.1 percent of the weight of the fat or oil to be stabilized, opens new and extremely important avenues to food conservation and prevention of economic losses. One thing which gives rise to skepticism as to the general usefulness of these antioxidants is the extremely objectionable and highly offensive odor that practically all mercaptans and allied compounds possess, even in minute quantities. While it is possible, as the patents state, that the two named groups of mercapto-compounds are odorless, the danger cannot be overlooked, that either minute impurities in the antioxidants, or substances subsequently developed in the course of stabilization, may cause greater deteriorations of odor than rancidity.

Digest from U. S. Patents 2,397,960 and 2,397,976, issued April 9, 1946 on applications dated Aug. 28, 1944, and July 25, 1942 to M. F. Gribbins, F. W. Miller, Jr. and D. K. O'Leary, and to D. K. O'Leary respectively, and assigned to E. I. duPont de Nemours & Co., Wilmington, Del.

FOOD CHEMISTRY

Synthetic Cinnamon Oil

A STUDY has been made of possible substitutes for cinnamaldehyde, the main constitutent of oil of cinnamon. Sixteen compounds have been prepared and studied. Five have suitable organoleptic properties. They are: furanacrolein, cinnamaldehyde dimethyl acetal, *p*-methoxycinnamaldehyde, α-methylcinnamaldehyde and α-methylfuranacrolein. Furanacrolein is considered most satisfactory.

Of the 16 compounds examined, three are new: cyclopentenylacrolein, tetrahydrocinnamaldehyde, and 2,5-endomethylenetetrahydrocinnamaldehyde.

From the study it is concluded that the following structural characteristics are essential to a cinnamon-like odor and taste: A ring structure with the proper aromaticity which is not modified too greatly by the presence of organoleptically active groups, and the acrolein nucleus in which the aldehyde group is free or easily regenerated (acetal) and in which no large side chains exist.

Digest from "A Study of Cinnamon Oil Substitutes" by C. Bordenca, Division of Agricultural and Food Chemistry, American Chemical Society, Chicago, Ill., Sept. 12, 1946.

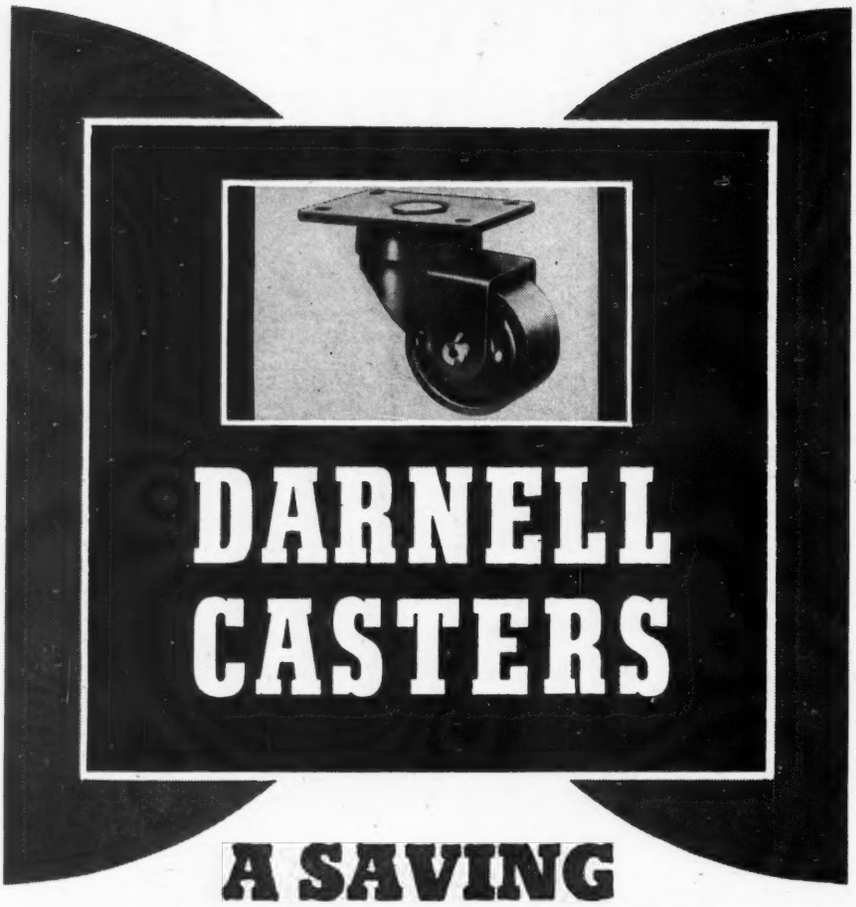
Index to Abstracts

MICROBIOLOGY
Molds in Blueberries 189
FATS AND OILS
New Antioxidants 189
FOOD CHEMISTRY
Synthetic Cinnamon Oil 189
DEHYDRATION
Dehydrating Meats 189
Desiccation of Food 190
Dehydrating Foods 190
DAIRY
Slow Acid Production in Cheese-Making 194
Butter Concentrate 194
ENGINEERING
Improved Machines for Procesing Grapes 196
QUALITY CONTROL
Moisture in Dried Foods 198
PACKAGING
Frozen-Food Container 200
Moisture-proof Wrapper 200
MISCELLANEOUS
Nutritive Values of Dried Food Products 202

DEHYDRATION

Dehydrating Meats

IMPROVEMENT over conventional methods of dehydrating granular materials on trays or in revolving drums is the basis of a patented process and apparatus for dehydrating meats containing fats and removing the fats from the meats. Granulated meat is fed through an aperture in a Venturi tube at the lower end of a vertical drying tube while passing a stream of drying gas upwardly through the apparatus. The material is carried up into the processing tube until it reaches a point where the upward force of the drying gas and the force of gravity are in equilibrium. Here the granular material is tumbled about in suspension until it is sufficiently altered by drying to be carried out of the top of the processing tube into a cyclone collector. At the lower end of the processing tube is a chamber into which the liquid fats drain as they separate from the meat during the drying process. From the cyclone collector the drying gas circulates through a heater and back to the processing apparatus. The meat particles may be removed from the collector as a finished product or


DARNELL
CASTERS
A SAVING
AT EVERY TURN
You are sure to find the exact caster or wheel for your individual requirements in the Darnell line.
Free DARNELL MANUAL
DARNELL CORP. LTD. 60 WALKER ST. NEW YORK 13 N.Y.
LONG BEACH 4 CALIFORNIA 36 N. CLINTON CHICAGO 6 ILL.

put through a second dehydrating unit in series with the first. Or, in the same unit, a batch of material may be given successive treatments with sulphur dioxide, blanching steam, and drying air. Automatic regulation of dry- and wet-bulb temperatures of the drying gas is provided by a thermostat and a hygrostat, respectively, placed in the stream of gas before it enters the processing tube.

Digest from U. S. Patent 2,406,395, issued August 27, 1946, on an application dated October 12, 1943, to W. A. Noel, Washington, D. C., and assigned to the United States of America.

Desiccation of Food

A METHOD of desiccating foods at low temperatures and pressures, thus avoiding loss of vitamins and impairment of taste that would occur at atmospheric pressure and high temperatures, is revealed in a recent patent.

In a closed system of desiccation the vapor pressure of the evaporating moisture tends to increase the pressure in the system. So, in order to maintain a total low pressure during the process it is necessary to remove these vapors as fast as they form. But mechanical pumps capable of providing the initial low free air pressure in the system can not also remove evaporating vapors with sufficient rapidity to maintain the desired low pressure after desiccation begins. This the inventors propose to accomplish by freezing the vapors on refrigerated condensers within the system and in advance of the mechanical pump. The efficiency of the condensers is maintained by continuous mechanical removal of the ice formed by condensing vapors, dropping it into a refrigerated receptacle on which inlet and outlet condensers are mounted.

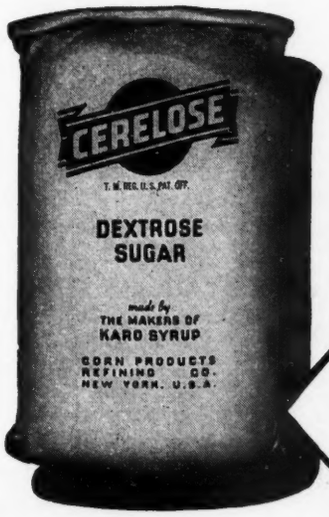
Digest from U. S. Patent 2,406,682, issued August 27, 1946, on an application dated March 9, 1944, to N. V. Hayes and W. B. Humes, Boston, Mass., and assigned to National Research Corporation, Boston, Mass.

Dehydrating Foods

ANOTHER method of removing evaporated vapors during the low-temperature drying of food products is revealed in a patent relating to dehydrating in the frozen state. As in the preceding digest, the inventor recognizes the difficult pumping problem involved in the removal of water vapor from a low pressure, low temperature drying system; but instead of freezing it out, as in the preceding item, he proposes to condense it by a spray of cold aqueous

(*Turn to page* 194)

Year after year...



Year after year extensive advertising has hammered home the facts about dextrose. Today 8 people out of 10 know what it means when the label says . . . "rich in dextrose."

CORN PRODUCTS SALES CO.
17 BATTERY PLACE NEW YORK 4, N. Y.

rich in dextrose

CERELOSE is dextrose

What's

next for enrichment?

MANY manufacturers of many different kinds of foods are giving serious thought to fortification.

Some of the products which have received much attention in this respect are shown on the opposite page. Some of these products have already been fortified by manufacturers.

It is well to remember this: If there are no definitions and standards for enrichment of the products you make, you may *fortify* without hesitation.

Standard Brands' experience in the food fortification field—and its products for vitamin B-Complex, vitamin D and protein supplementation of foods—place this company in a position to render valuable assistance to you on your food problems.

If you are now seeking ways of fortifying your company's products, we invite you to discuss your needs in confidence with one of our executives.

Products containing
VITAMIN D

Fleischmann's Hy-Dee
Irradiated Dry Yeast

Fleischmann's Irradiated Dry Yeast
Type 700-H

Standard Brands Viosterol
(Activated Ergosterol) Steenbock Process

Products containing
NATURAL B-COMPLEX FACTORS

Fleischmann's
Pure Dry Primary Yeasts *(Brewer's Strain)*

Fleischmann's
Bee-Flex Products

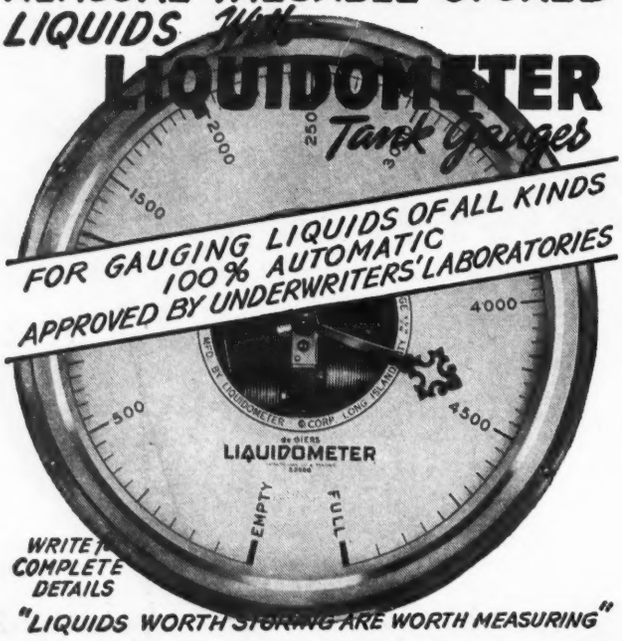
Fleischmann's
Brewer's Yeast Extract Types 3 and 41

Fleischmann's
Yeast Extract and Liver

STANDARD BRANDS INCORPORATED

Pharmaceutical Division • *595 Madison Avenue* • *New York 22, N. Y.*

COSTLY HUMAN ERRORS ELIMINATED WHEN YOU MEASURE VALUABLE STORED LIQUIDS With
LIQUIDOMETER Tank Gauges
FOR GAUGING LIQUIDS OF ALL KINDS
100% AUTOMATIC
APPROVED BY UNDERWRITERS' LABORATORIES



WRITE FOR COMPLETE DETAILS
"LIQUIDS WORTH STORING ARE WORTH MEASURING"
THE LIQUIDOMETER CORP.
38-14 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

Look for Imprint "La Porte" in Metal to Be Sure It's La Porte

La Porte Flexible Steel Conveyor Belting carries your products through every phase of processing — from bin to shipper. Its strong, resilient steel mesh construction withstands the impact of loading . . . maintains a perfectly flat surface, without stretching, weaving, slipping or jumping, . . . allows free circulation of air and liquids around products in process. It is not affected by steam, acids or extreme temperatures and needs no special dressing to assure efficiency. ***Use La Porte Conveyor Belting all along the line — it is available in any length and almost any width. Ask your Supplier TODAY.***

LA PORTE MAT & MFG. CO.
BOX 124 LA PORTE, INDIANA

salt solution which is continuously removed from the closed evacuated system. Advantage is claimed for the simple and inexpensive type of equipment which can be readily installed or dismantled.

Digest from U. S. Patent 2,402,401, issued June 18, 1946, on an application dated June 25, 1942, to K. C. D. Hickman, Rochester, N. Y., and assigned to Distillation Products, Inc., Rochester, N. Y.

DAIRY

Slow Acid Production In Cheese-Making

SLOW acid production in the cheese laboratories of Iowa State College, usually apparent at the time of draining the whey or shortly thereafter, was traced to bacteriophage, which caused almost complete cessation of acid production. Cheddaring for a long period of time (4 to 5 hours) did not result in an appreciable increase in acidity when acid production was slow because of bacteriophage action. When a vat of skim milk intended for cottage cheese was contaminated slightly with bacteriophage active against the culture employed, acid formation was very slow for about 24 hours after setting. During this same period the bacteria count showed a slight increase, then a large decrease, and finally a large increase. The bacteriophage increased for 7 to 12 hours following setting and then remained practically constant. The infected culture resumed growth usually after 24 hours, at which time acid production proceeded normally.

Digest from "Factors Influencing Acid Production by Cheese Cultures. II. Influence of Bacteriophage on Acid Production in the Manufacture of Cheddar and Cottage Cheese," by F. J. Babel, *Journal of Dairy Science*, vol. 29, 597-606, September, 1946.

Butter Concentrate

IN a group of four related patents disclosure is made of a method for producing a concentrated butter product containing in their natural condition substantially all the flavors, vitamins, and antioxidants in butter. The product is liquid at ordinary ice box temperatures, and is stable toward oxidative changes. Concentration of the desirable constituents is accomplished by use of a selective solvent miscible with butter oil at temperatures substantially above room temperature, say 95 deg. F., and partly immiscible therewith at lower temperatures, say 41 deg. F. Useful solvents for the purpose are: (1) aliphatic mo-

PROFIT BY THE KETTLE-FULL

Wear-Ever Steam-jacketed kettles used by Pedgrift Jellies, Chicago, Ill.

The cooking efficiency of Wear-Ever Aluminum steam-jacketed kettles have made them a leader in the food industry. Wear-Ever Aluminum spreads heat so *quickly* and spreads it so *evenly*, that food cooking is done uniformly.

Now, made of an amazingly tougher, harder aluminum alloy than heretofore practical, Wear-Ever steam-jacketed kettles provide still greater durability than ever before. Think what this means in even *lower* maintenance costs. And the stronger, harder alloy affords extra protection against denting, scratching, marring . . . will keep your kettles new-looking for years and years.

Plan to meet your requirements with Wear-Ever. The Aluminum Cooking Utensil Co., 312 Wear-Ever Building, New Kensington, Pa.

ALUMINUM *is friendly to foods*

Aluminum protects the color, flavor and purity of foods. It resists corrosion, is easy to clean, and meets the extra high quality standards of today's leading food plants. Proved by over a quarter century of use throughout the food industry.

WEAR-EVER ALUMINUM TRADE MARK REG. U.S. PAT. OFF.

NOW...MORE WEAR THAN EVER IN—

WEAR•EVER Aluminum

Made of the metal that cooks best . . . easy to clean

Winner takes all
GOOD PACKAGING WINS

The winner is the package that is functional as well as eye-catching. It is a package adaptable to high speed production . . . one that is exactly suited to its job. Twitchell can help find the answer . . . from experience or special experiments.

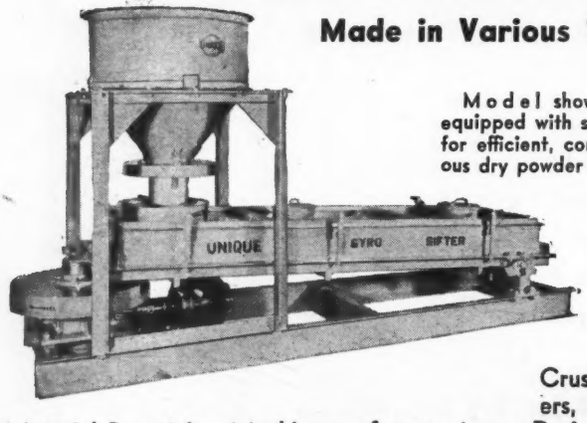
A complete line of wrappings, bags, envelopes and boxes in cardboard, glassine, cellophane, pliofilm, laminated papers, etc. for dry or frozen foods. Stock or original packages designed. Send your packaging problems to us today.

PACKAGING DIVISION 777 Public Ledger Bldg.
E. W. Twitchell Incorporated Philadelphia 6, Pa.

ROBINSON
PROCESSING UNIQUE EQUIPMENT

GYRO-SIFTERS

Made in Various Types and Sizes



Model shown is motor-driven . . . equipped with special telescopic hopper for efficient, continuous feeding of various dry powder formulations.

Crushers, Grinders, Sifters, Attrition Mills . . . Material Processing Machinery of every type. Designed to your requirements by experienced engineers whose reputation is founded upon doing things right. Literature available. Inquiries invited.

ROBINSON MANUFACTURING CO.
Plant: Muncy, Pa.
SALES REPRESENTATIVE
MERCER-ROBINSON COMPANY, INC.
30 CHURCH ST., NEW YORK 7, N. Y.

nohydroxy alcohols containing one to three carbon atoms; (2) hydrocarbons containing five to eight carbon atoms; (3) chlorinated hydrocarbons containing one to three carbon atoms; (4) aliphatic esters containing two to five carbon atoms; (5) aliphatic ketones containing three to five carbon atoms.

In carrying out the process, butter is melted by warming slowly to separate the whey (water) portion from the butter oil. The latter is filtered and then agitated with warm solvent. Cooling causes a layer separation of the concentrated butter product from the remainder of the oil. Part of the butter oil will solidify. It is removed by filtration and retreated with solvent, yielding a white pure fat with little aroma or flavor, useful as a shortening. The combined solvent-oil extracts are then treated in any usual manner, e.g., vacuum distillation, to obtain a stable oil in which are concentrated the vitamins, flavors, and natural antioxidants in the original butter.

Digest from U. S. Patents 2,404,034-035-036-037, issued July 16, 1946, on applications dated August 14, 1941 (for the first) and July 18, 1945 (for the last three), to L. O. Buxton, and assigned to National Oil Products Co., Harrison, N. J.

ENGINEERING

Improved Machines for Processing Grapes

CONTINUOUS processing of grapes for the production of wine juices uncontaminated by matter contained in stems, pits, or skins, is claimed for a recently patented machine, the parts of which are so coordinated and synchronized as to subject grapes to a series of operations yielding separate finished products. The entire process from vineyard to finished products may be accomplished in three to four hours.

After the grapes are cleaned by pressure sprays of water and dried by forced air circulation, they are crushed under successively greater pressures by passing between pairs of rollers of resilient materials set at predetermined distances apart. The first set of rollers merely breaks the grapes open without crushing any part of them. The liberated juices are collected and cooled to a temperature not exceeding 40 deg. F. In the second operation the pulp of the grapes is crushed, but their pits, stems, and skins are left whole and intact. The juice is separately collected, and the pulp subjected to a third operation to press out the

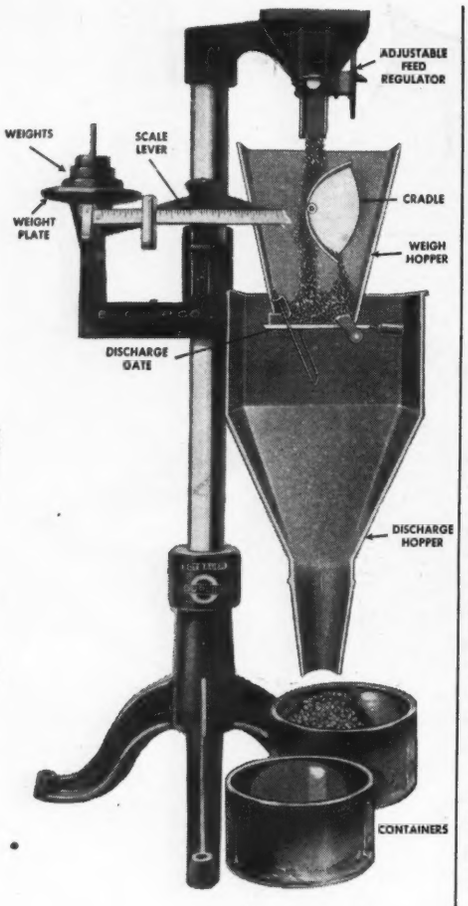
The right package reflects the quality of the product it contains. This *Shell-Pli laminated window carton, designed and produced for the Texas Bakers Corporation, affords buy-appealing visibility and brand identification . . . and truly reflects the high quality of an outstanding product. Another example of Shellmar's scientific planning, fine printing and flawless production.

Sales Offices in Chicago, New York, Cincinnati, Cleveland, Detroit, Kansas City, Minneapolis, San Antonio, Atlanta, Baltimore, Boston, Philadelphia, Pittsburgh, Los Angeles, Salt Lake City, San Francisco, Seattle

SHELLMAR
PRODUCTS CORPORATION
MOUNT VERNON, OHIO • SOUTH GATE, CALIF.
MEXICO CITY, MEXICO

*T. M. Reg. U. S. Pat. Off.

PACKAGE MANUFACTURER - PRINTER - LAMINATOR - CONVERTER . . . CELLOPHANE - PLIOFILM - ACETATE - SARAN - VINYLS - FOILS - PAPERS - COATINGS



GET Uniform Accuracy

IN YOUR

WEIGHING OPERATIONS

DRY powdered, granular, flaked or coarse particled materials are weighed quickly and with UNIFORM accuracy with Edtbauer-Duplex Net Weighers. The cross-section view of this dependable, precision-built machine shown above gives graphic evidence of the simple operating principle employed. Gravity and Power Feed Models are available for free flowing and non-free flowing materials. Accuracy is assured in weights ranging from 3 ounces to 50 lbs. May we send you complete information?

EDTBAUER-DUPLEX

Automatic

NET WEIGHER

B. F. Gump Co.

Engineers and Manufacturers Since 1872

415 South Clinton Street • Chicago 7, Ill.

last bit of juice without, however, crushing the pits and stems. The juice is again separately collected, and the pulp passes to a de-stemming device which rejects the stems. The remainder passes through a shredding or macerating device and thence to a centrifuge separator from which pits, skins, and pulp are separately obtained for further use or disposal.

Digest from U. S. Patent 2,398,440, issued April 16, 1946, on an application dated June 23, 1944, to G. Monnet, New York, N. Y.

QUALITY CONTROL

Moisture in Dried Foods

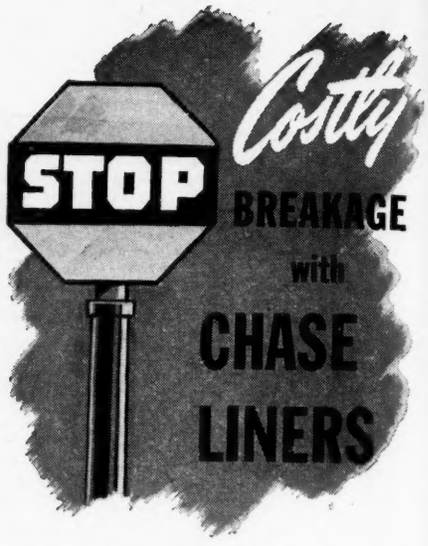
MOISTURE determinations on dried food products are often rendered uncertain by the fact that many plant substances do not achieve a constant weight loss on drying in an oven, but continue to lose weight for considerable periods. The continued loss in weight is usually the result of decompositions that are not related to the true moisture of the sample, and a compromise must be made.

When a sample is dried in a vacuum oven for about 100 hours, it may be assumed to be essentially dry. If permitted to absorb a known amount of water, the time required to obtain a weight loss equivalent to the water absorbed may be taken as the correct drying time for the material.

By use of the "redrying time" procedure, methods were developed for obtaining correct moisture contents of carrots, cabbage, potatoes and onions. The moisture content of the dried vegetables, the variety, fineness of grind, and oven temperature all had a bearing on the determination. The times required to reach moisture contents that did not deviate more than ± 0.1 percent from the values obtained by the "re-drying" procedure were 29 to 35 hours for Imperial and Chantenay carrots having 0.6 to 7.8 percent moisture when dried at 150 deg. F. For potatoes of 3.0 to 18.0 percent moisture 43 to 67 hours were necessary.

Drying time decreased with fineness of grind up to 60 mesh but there was little difference between 40 and 60 mesh.

The general problem of moisture determinations in dried food products is thoroughly discussed and conditions of sampling, oven conditions, degree of vacuum. vapor pressure of water in samples and



Chase Liners are crinkled and pleated. They're flexible, elastic — stretch in all directions. Provide greater protection, stop costly liner breakage. Check on Chase Liners today — it's the better product that costs no more than ordinary liners.

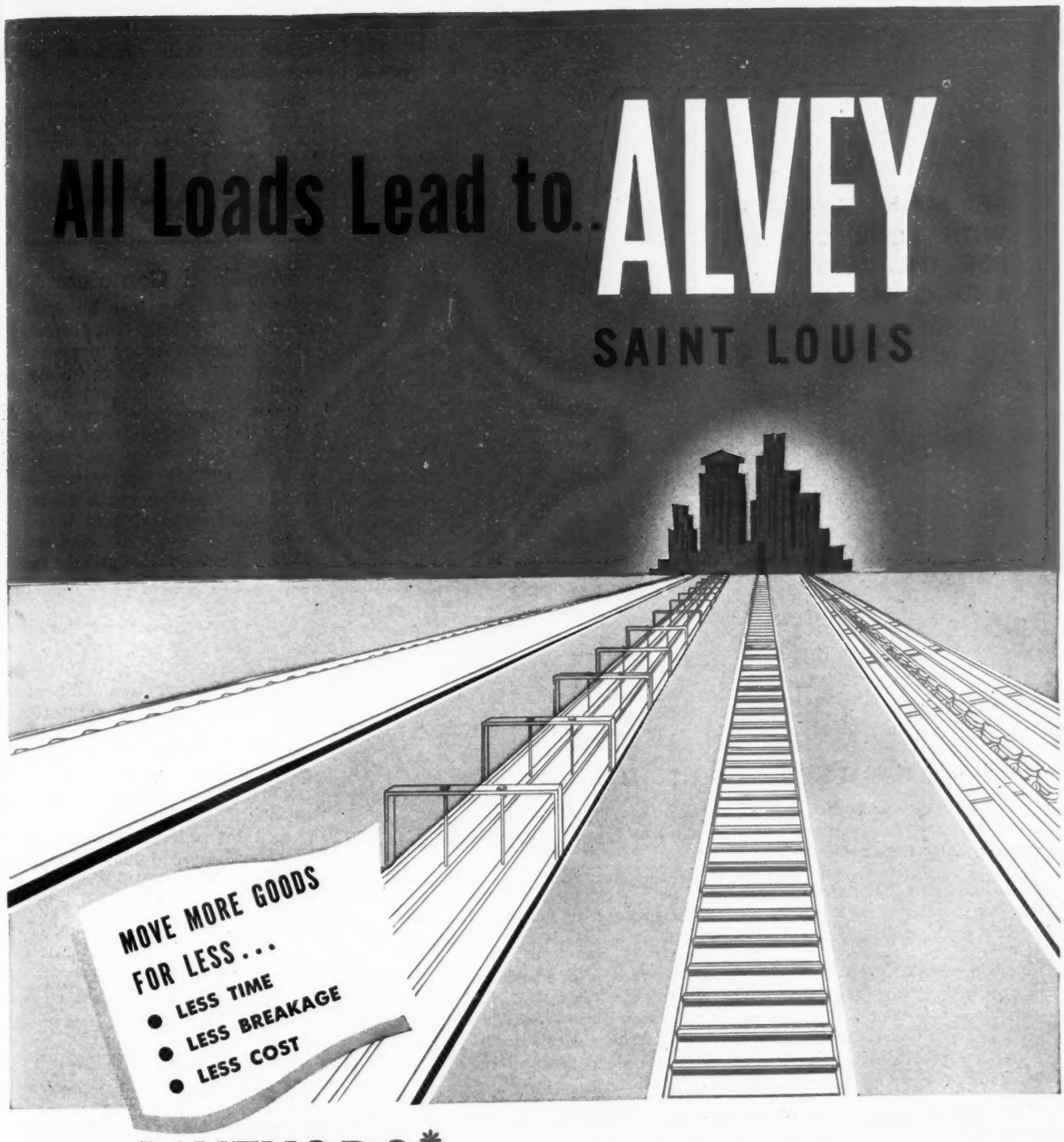
CHASE BAG CO.

GENERAL SALES OFFICES

309 WEST JACKSON BLVD., CHICAGO 6, ILL.

BOISE • DALLAS • TOLEDO • DENVER • DETROIT • MINNEAPOLIS
ST. LOUIS • NEW YORK • CLEVELAND • MILWAUKEE • PITTSBURGH
BUFFALO • KANSAS CITY • MEMPHIS • GOSHEN, IND. • PHILADELPHIA
NEW ORLEANS • ORLANDO, FLA. • SALT LAKE CITY • OKLAHOMA
CITY • PORTLAND, ORE. • REIDSVILLE, N. C. • HARLINGEN, TEXAS
CHAGRIN FALLS, O. • HUTCHINSON, KAN. • WINTER HAVEN, FLA.

All Loads Lead to ALVEY
SAINT LOUIS



with **ALVEYORS*** the word for every **CONVEYOR** need!

*TRADE MARK

BIG MAINTENANCE JOB WITH YOUR COOLERS FOR OIL, WATER AND OTHER FLUIDS?

NOT WITH ROSS "CP" DESIGN

In any cooling system, where two fluids are involved, one fluid will normally foul more than the other. Fouling naturally cuts heat exchange efficiency and creates service interruptions.

The point is that fouling tendencies, most of the time, can't be avoided . . . but shutdown periods can be *materially shortened* with Ross "CP" Coolers which are designed for *quick inspection and easy cleaning.*

To minimize maintenance, the fluid having the greater fouling tendency is circulated through the *inside of the tubes* in the Ross design. For inspection or cleaning, you merely remove the channel cover plates. This gives you quick, easy access to tube interiors *without breaking any pipe connections.* When it is desirable to clean the outside of the tubes, the bundle is easily and quickly withdrawn from the shell.

Have you any idea how many hours this subtracts from maintenance and adds to productive operation?

Bulletin 5322 covers details completely.

ROSS

FIRST IN HEAT EXCHANGERS

ROSS HEATER & MFG. CO., INC.

Division of American Radiator & Standard Sanitary Corporation

1443 WEST AVENUE BUFFALO 13, N. Y.

ROSS EQUIPMENT IS MANUFACTURED AND SOLD IN CANADA BY HORTON STEEL WORKS LTD., FORT ERIE, ONTARIO

other experimental details are described and their effects on accuracy evaluated.

Digest from "Moisture Determination in Dehydrated Vegetables, Vacuum Oven Method," by B. Makower, S. M. Chastain and E. Nielsen, *Industrial and Engineering Chemistry,* vol. 38, 725-731, July, 1946.

PACKAGING

Frozen-Food Container

FEATURING a container blank that can be quickly folded and erected, even by inexperienced persons, a recently patented design offers a frozen-food container that has upper and lower walls formed of a single thickness of material and vertical side walls of a plurality of thicknesses. This construction permits quick freezing of the contents by the conduction of heat through the relatively thin upper and lower walls, and provides relatively thick side walls of considerable stacking strength.

No form is required for the erection of the container. The two end walls have flaps that fold inwardly in U-shaped formation. When so folded and erected, a reinforcing sleeve is slipped over them, thus providing a rectangular receptacle for the material to be frozen. All portions of the container may lie flat until it is to be filled, and all of the container except the part being filled may lie flat during the filling operation. The container may be sealed by taping a locking flap to the top wall.

Digest from U. S. Patent 2,405,499, issued August 6, 1946, on an application dated September 11, 1943, to R. Guyer and R. J. Hennessey, and assigned to Waldorf Paper Products Co., St. Paul, Minn.

Moisture-proof Wrapper

AN IMPROVED moisture-proof, heat-sealing wrapping tissue for packaging cheese and similar food products is described in a recent patent. The base material is a non-moisture proof cellulosic sheet or film, on one side of which are deposited successively a film of lacquer and a coating of wax. The composite structure is resistant to moisture, has high tensile strength and limited extensibility, and can be heat-sealed to form a package that will preserve the contents in their original condition during the interval between manufacture and distribution to the consumer. The lacquer coating need be only 0.0001 to 0.0002 in. in thickness, and the wax coating between 0.001 and 0.003 inches. A suitable lacquer contains equal parts by weight of nitrocellulose, ½ to 10

News, Advertising, Readership Devoted to Building a Better Civilization

READER RESPONSE WHERE IT COUNTS

A valued advertiser in THE CHRISTIAN SCIENCE MONITOR has written:

"I thought you would like to know how the subscribers of The Christian Science Monitor cooperate with advertisers. There is no guessing about it. The results are definite. They all seem to be glad to use our products and tell their neighbors to 'go do likewise'. We consider the Monitor the best advertising medium we use."

We call this to your attention not as a piece of exceptional eulogy but as strong, typical evidence that THE CHRISTIAN SCIENCE MONITOR reaches a market far above the average in responsiveness and buying power. MONITOR readers have unusual loyalty for their international daily newspaper and do not hesitate to recommend both the news and advertising columns to their friends. Many of the world's leading merchants, manufacturers, and service companies have proved that it pays to advertise regularly in the MONITOR.

May we give you full information about the MONITOR MARKET? A telephone call or letter will bring this information promptly. THE CHRISTIAN SCIENCE MONITOR, One, Norway Street, Boston 15, Massachusetts.

Branch Offices

NEW YORK: 500 Fifth Avenue
CHICAGO: 333 N. Michigan Avenue
DETROIT: 3-101 General Motors Building
KANSAS CITY: 1002 Walnut Street
SAN FRANCISCO: 625 Market Street
LOS ANGELES: 650 S. Grand Avenue
SEATTLE: 824 Skinner Building
PARIS: 56 Faubourg Saint Honore
LONDON, W. 1: 21-23 Shaftesbury Avenue
GENEVA: 28 Rue du Cendrier
SYDNEY: 46 Pitt Street

The CHRISTIAN SCIENCE MONITOR
An International Daily Newspaper

We're Shouting About Another Palmer First!

A SENSATIONAL NEW THERMOMETER WITH

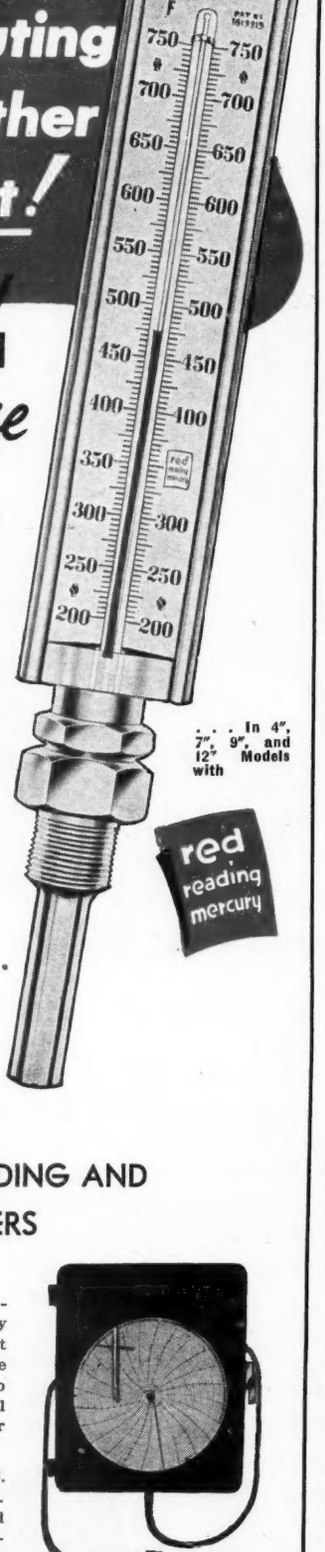
Extruded Brass Case

(PATENTED)
DUST-PROOF
FUME-RESISTANT

Palmer—originators of famous "Red-Reading-Mercury" are first again with a sensational new Thermometer. This new Thermometer features an Extruded Brass Case with V-shape design, patented by PALMER. The case is fume-resistant, dust-proof, and much more attractive—with pleasing contours and a durable nickel finish.

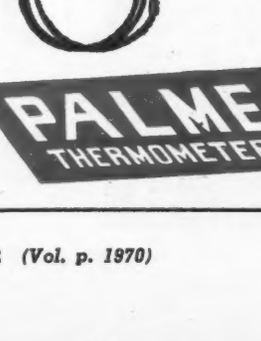
Equally important, the V-shape design offers a *much larger scale* for easier reading plus greater protection to the tube. Other important features of this new Thermometer are: double-strength, non-rattling glass shield; "snap-on" cap for easy removal of shield; and "Red-Reading-Mercury" for quick, accurate reading.

This Thermometer is ruggedly built and very adaptable, with a wide range of fittings. Send for detailed Bulletins No. 46-2 and No. 46-3.



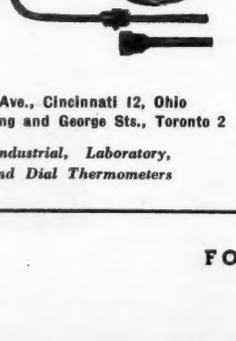
In 4", 7", 9", and 12" Models with

PALMER SUPERIOR RECORDING AND DIAL THERMOMETERS



RECORDING THERMOMETERS. Mercury Actuated. 12 in. die-cast aluminum case. Flexible armoured tubing and bulb of stainless - steel. All ranges up to 1000F or 550C.

DIAL THERMOMETERS. Mercury Actuated. 8 in. case. Flexible armoured tubing and bulb of stainless-steel. All ranges up to 1000F or 550C.



PALMER THERMOMETERS INC.

2529 Norwood Ave., Cincinnati 12, Ohio
Canadian Plant: King and George Sts., Toronto 2

Mfrs. of Industrial, Laboratory, Recording and Dial Thermometers

sec., and a polyvinyl butyral resin mixed with enough plasticizer to give the desired adhesion and flexibility. Suitable thinners are added to make the lacquer applicable by conventional coating methods. Any natural or synthetic wax may be used that will not impart odor or taste to the product. The wrapper is applied with the wax-coated surface in contact with the food product.

Digest from U. S. Patent 2,402,605, issued June 25, 1946, on an application dated November 4, 1943, to T. Cowen, Malverne, N. Y., and assigned by mesne assignments to Standard Cap and Seal Corp., a corporation of Virginia.

MISCELLANEOUS

Nutritive Values of Dried Food Products

NUTRITIVE values of dried vegetables and fruits, compiled from data obtained by analyses of samples taken from 5 gal. cans coming off production lines, are reported. Analyses were made for carotene, ascorbic acid, thiamin, riboflavin, and niacin, and for protein, fat, fiber, ash, carbohydrates, calcium, phosphorus, and iron. The products included were white and sweet potatoes, carrots, cabbage, beets, onions, navy bean soup, yellow pea soup, chicken noodle soup, green pea soup, tomato juice cocktail, cranberries, prunes, apricots, peaches, and apple nuggets.

The vitamin data indicate that large variations exist within the same product, a ten-fold variation in ascorbic acid and thiamin content in white potatoes, for instance. Sulphiting of cabbage and potatoes reduces the thiamin content markedly and the remainder disappears rapidly on storage. Ascorbic acid content, on the other hand, is increased by sulphite and is retained better during storage when sulphite is present.

Since the carbohydrate content of the dehydrated foods tested is 58 to 91 percent, their chief contribution to diet is caloric intake. Some, such as bean and pea soups, and onions, cabbage and beets, are notably richer in calcium and phosphorus than the others tested. Those products showing good vitamin retention are usually those having highest palatability and acceptance.

Digest from "Nutritive Value of Dehydrated Vegetables and Fruits," by P. L. Pavcek and The Committee on Food Composition (Food and Nutrition Board, National Research Council) *Industrial and Engineering Chemistry*, vol. 38, 853-56, August, 1946.

BOOKS

Employee Complaints

THE PRACTICAL WAY TO HANDLE GRIEVANCES. Published by the Labor Relations Institute, 1776 Broadway, New York 19, N. Y., 1946. 6¾x8½ in.; 58 pages; paper. Price, $2.25.

The claim is made that 40 percent of the 1946 strikes could be traced to differences over working conditions as distinct from wage disputes. Even though this estimate may be high, there is little doubt that the plant providing no effectual employee grievance outlet is offering a fertile field for the growth of small "gripes" into major disputes.

While this little book will not solve all labor problems, it does provide a method for setting up an employee grievance program that works.

Farm Figures

AGRICULTURAL STATISTICS. 1945. Published by U. S. Department of Agriculture, 6x9 in.; 604 pages; paper. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price, $1.00.

This annual volume once again brings together the important statistics compiled by the Department of Agriculture during the year. As with the 1943 and 1944 editions, this one is somewhat abridged. The tabulated data, for instance, goes back only to 1929 or 1930, or to the latest ten years.

From every other aspect, however, the volume is as comprehensive as in former years.

The Same Old Problem

THE INDUSTRIAL REPUBLIC. By P. W. Litchfield. Published by The Corday & Gross Co., Cleveland, O.; 1946. 6¼x9¼ in.; 201 pages; cloth. Price, $4.00.

It is astonishing, these days, to read that, basically the problem of employee relations has not changed since the beginning of the century. Moreover, it is interesting to reread a treatise on labor relations that was regarded, by conservative business, as radical back in 1919.

This is the kind of book that will probably be damned by radical labor, today, because it insists that Labor recognize its own responsibilities and the rights and importance of Capital. Capital, which means the industrial executive, will accept its principles, but is probably not yet conditioned to lend the wholehearted action necessary to bring these principles into force.

Nevertheless, the book clears out many of the cobwebs that exist in many minds. It should be required reading for all three branches of the industrial economy—Labor, Capital and Consumer, which takes in everyone.

The book is divided into four parts: *The Industrial Republic,* first published in 1919; *Industry Under the Industrial Assembly,* covering the period from 1919 to 1936; *Industry Under National Unions,* 1936 to 1946; and *A Democratic Solution.* Written by the chairman of the board of the Goodyear Tire & Rubber Co., it is as timely now as when its Part I appeared in 1919. It is to be hoped that its principles will be followed more closely this time.

Pay Plan

JOB EVALUATION AND EMPLOYEE RATING. By Richard C. Smyth and Matthew J. Murphy. Published by McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y., 1946. 6x9 in.; 255 pages; cloth. Price, $2.75.

Some of the major plans now being used for equitable payroll distribution are analyzed in this book, one of the McGraw-Hill industrial organization and management series. Such a plan, of course, involves a great many factors, of which job evaluation and employee rating are the most important, but by no means the only ones.

How such a program can be established and maintained is outlined in the sequence that would have to be followed if the program is to be made to function effectively.

Math Shortcuts

MATHEMATICAL AIDS FOR ENGINEERS. By Raymond W. Dull. Published by McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y., 1946. 5½x8½ in.; 346 pages; cloth. Price, $4.50

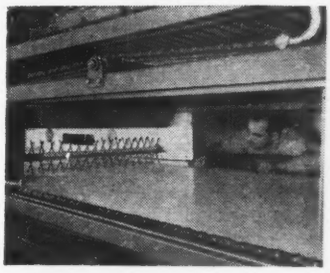
Basic mathematical aids, from simple numeric computations through differential calculus, integration and summation, are set forth in this convenient reference book for engineers. Practically every phase of mathematics that might be of concern to the food engineer is included. With so many new engineering developments to cope with, the book's analysis of

Silicone News

DC SILICONE

Silastic* coating

for conveyor belt in Birdseye dehydrater



Photo, courtesy Processes, Inc.

Silastic coating on conveyor belts of stainless steel wire cloth endures average air temperature of 450°F. and radiated heat from coils containing Dowtherm at 650°F.

When Clarence Birdseye directed his inventive genius toward quick dehydration to supplement quick freezing as a method for preserving food, a primary problem was the rapid removal of moisture without excessive surface hardening. In the machine invented by Clarence Birdseye and built by Cleaver-Brooks Co., for commercialization by Processes, Inc., the problem of quick dehydration is solved through use of controlled heat applied by conduction, convection and radiation while the drying foods are agitated mechanically and by air traveling at a velocity of 1500 feet per minute.

Under the combined action of these three types of heat, about 40% of the moisture content of foods is removed in the first six minutes of processing. Uniformity of processing depends upon free movement of food along a succession of conveyor belts each about 35 feet between pulley centers and 46 inches wide.

That's where Silastic comes into the story. The Silastic coated conveyor belt fabricated by Connecticut Hard Rubber Co., has a smooth white surface to which food particles do not readily adhere. The Silastic coating is odorless, tasteless and flexible. Furthermore, it withstands the intense heat to which foods are first subjected.

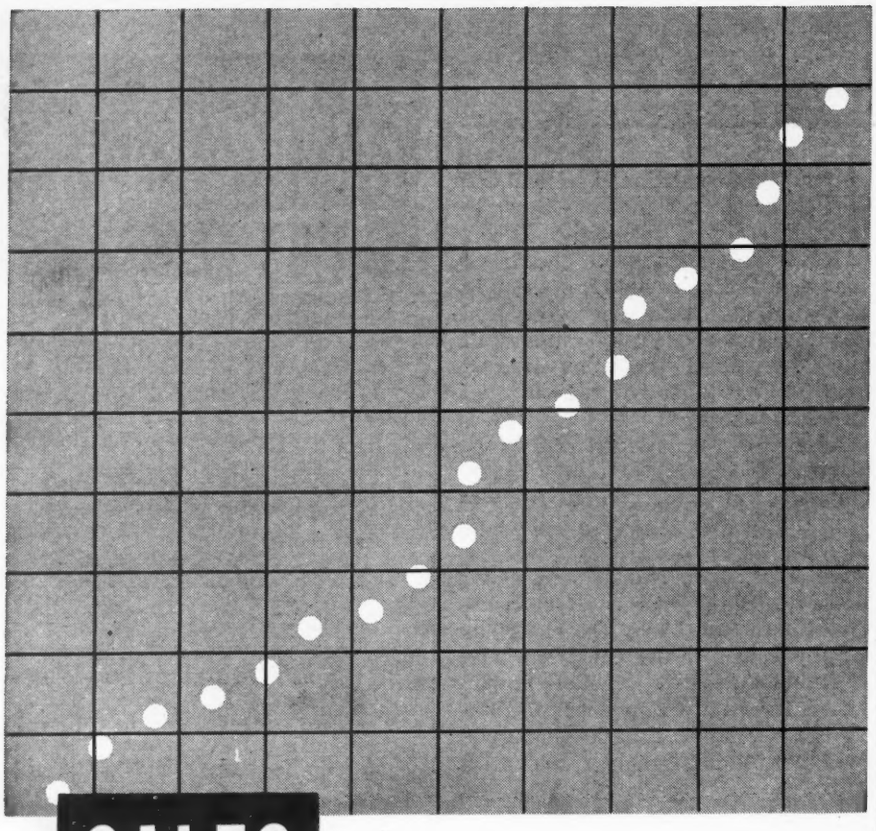
Additional data about Silastic, the Dow Corning Silicone elastomer is given in leaflet No. 0 2-2.

*Trade Mark, Dow Corning Corporation

DOW CORNING CORPORATION
MIDLAND, MICHIGAN

Chicago Office: Builders' Building
Cleveland Office: Terminal Tower
New York Office: Empire State Building
In Canada: Dow Corning Products Distributed by Fiberglas Canada, Ltd., Toronto

Dow Corning
FIRST IN SILICONES



SALES too, can be enriched

with Monsanto calcium phosphates

Manufacturers and processors of flours, breads, cereal foods and other similar products find that Monsanto calcium phosphates enrich both their products and their sales.

These and other Monsanto mineral supplements have long been widely accepted as contributing much to the dietary standards of America. In this connection, Monsanto calcium phosphates are particularly favored because of their exceptional quality — they are derived from Monsanto's elemental phosphorous, which is refined to better than 99.9% purity.

Note the list of Monsanto calcium phosphates included here, together with some of their suggested uses. Then contact any Monsanto office on any phase of food enrichment through mineral supplements. Or write direct to MONSANTO CHEMICAL COMPANY, Phosphates Division, 1700 South Second St., St. Louis 4, Missouri. District Offices: Akron, Birmingham, Boston, Charlotte, Chicago, Cincinnati, Dayton, Detroit, Los Angeles, Montreal, New York, San Francisco, Seattle, Springfield, Toronto.

Monsanto Calcium Phosphates	Uses of Monsanto Calcium Phosphates
Calcium Phosphate, Mono	To supply calcium and phosphorous as mineral supplements for foods . . . leavening agents . . . enriched flours . . . self-rising, phosphated plain flour . . . prepared flour . . . baking powder . . . medicinals . . . polishing agent in tooth paste and tooth powder . . . to prevent "caking" in salt and sugar.
Calcium Phosphate, Di	
Calcium Phosphate, Tri	
Calcium Phosphate, X-C (extra rich in calcium)	
Calcium Pyrophosphate	

MONSANTO CHEMICALS
SERVING INDUSTRY . . . WHICH SERVES MANKIND

fundamentals, along with its illustrative examples, should make it highly useful both as a review and as a means to extend mathematical knowledge.

GOVERNMENT PUBLICATIONS

The following recently issued documents are available, at the prices indicated, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. When no price is indicated the pamphlet is free and should be ordered from the bureau responsible for its issue.

SUGGESTED CHARTER FOR AN INTERNATIONAL TRADE ORGANIZATION OF THE UNITED NATIONS. Department of State Publication 2598.

CARROT PRODUCTION IN THE WEST AND SOUTHWEST. By Thomas W. Whitaker, et al. Department of Agriculture, Circular No. 750. Price 10 cents.

MAKING AND STORING FARM BUTTER FOR HOME USE. By William White. Department of Agriculture, Farmers' Bulletin No. 1979. Price 10 cents.

THE COPENHAGEN CONFERENCE. FAO Information Service Bulletin. Vol. 1 No. 6. October 4, 1946. Available free on request to Food and Agriculture Organization of the United Nations, 2000 Massachusetts Avenue N.W., Washington 6, D. C. A summary of principal actions.

UNITED STATES IMPORT DUTIES June 1946. Tariff Act of 1930 and changes since 1930. U. S. Tariff Commission. Price 70 cents.

U. S. STANDARDS FOR GRADES OF CANNED GRAPEFRUIT JUICE (effective November 1, 1946). Production and Marketing Administration, Fifth issue. Mimeographed.

U. S. STANDARDS FOR GRADES OF PROCESSED RAISINS (effective October 15, 1946). Production and Marketing Administration, Second Issue. Mimeographed.

THREE STANDARDS FOR PROCESSED FOODS: U. S. Standards for Grades of Canned Tomatoes, Effective August 1, 1946; U. S. Standards for Grades of Canned Plums, Effective August 15, 1946; Tentative U. S. Standards for Grades of Frozen Berries, Effective August 15, 1946. These are available from Production and Marketing Administration, U. S. Department of Agricultural, Washington 25, D. C.

PATENTS

ENGINEERING

Butter Made in Continuous Manner—Arthur W. Farrall, Wilmette, Ill., to Creamery Package Mfg. Co., Chicago, Ill. No. 2,406,819. Sept. 3, 1946.

Eggs and Like Cleaned in Continuous Manner by Abrasive Action—Clark H. Inman, Lakewood, N. J. No. 2,408,648. Oct. 1, 1946.

Food Processed in Low Capacity and Manually Operated Combination Cooker and Ricer—David Fay Hosman, Omaha, Nebr. No. 2,406,769. Sept. 3, 1946.

Nuts, Such as Pecans, Cracked in Continuous Manner by Automatic Mechanical Means—Leon K. Maulsby and John A. McGrann, San Antonio, Tex., to Leon K. Maulsby. Reissue No. 22,797. Oct. 1, 1946.

Vegetable and Other Food Material Frozen Under Vacuum in Continuous Multi-Stepped Process—Frank B. Doyle, Phillipsburg, N. J. to Ingersoll-Rand Co., New York, N. Y. No. 2,407,482. Sept. 10, 1946.

FATS AND OILS

Butter and Butter Oil Concentrate Made From Milk Fat by Agitation in Presence of Controlled Quantity of Gas at Controlled Temperatures—Ingie J. Lundal and Roy P. Robichaux, Chicago, Ill., One-Half to Cherry-Burrell Corp., Chicago, Ill. and One-Half to Sugar Creek Creamery Co., Danville, Ill. No. 2,407,612. Sept. 10, 1946.

Synthetic Glycerides Prepared From Unsaturated Higher Fatty Acids—Howard C. Black and Charles A. Overly to Industrial Patents Corp., Chicago, Ill. No. 2,408,905. Oct. 8, 1946.

FRUITS AND VEGETABLES

Fruits and Vegetables Dehydrated During Passage of Dry Air Through Cabinet Fitted With Roughened Surface Trays—George H. Phelps, Floral Park, N. Y. to Metropolitan Device Corp., Brooklyn, N. Y. No. 2,410,129. Oct. 29, 1946.

Fruits and Vegetables Mechanically Graded According to Size—Gustave H. Bleeke, Fort Wayne, Ind. No. 2,410,147. Oct. 29, 1946.

PACKAGING

Fiber Milk Bottles Made to Have Tubular Conical Wall With Outturned Flange and Adapted to Disk Closure—James E. Annen, to Sutherland Paper Co., Kalamazoo, Mich. No. 2,409,655. Oct. 22, 1946.

Splinterless Case for Waxed Paper Milk Carton, Made From Plastic Material—Louis E. Folst to Edgewick Investment Co., Los Angeles, Calif. No. 2,409,748. Oct. 22, 1946.

STARCH AND SUGAR

Crystallization of Sucrose-Rich Sirup Retarded by Addition of Sterile Leuconostoc mesenteroides Culture Liquor Product Consisting of 50 Percent Dextran, 36 Percent Levulose, 6 Percent Dextrose, 2 Percent Sucrose and 6 Percent Non-Sugars—Daniel V. Wadsworth, Manhasset, N. Y. and Mary F. Hughes, Jersey City, N. J. to Refined Syrups & Sugars, Inc., Yonkers, N. Y. No. 2,409,816. Oct. 22, 1946.

Starch Conversion Sirup With Dextrose Equivalent Content Between 45-55 Percent Subjected to Dialysis Against Water Through Semipermeable Membrane to Recover Dialyzate With Dextrose Equivalent Greater Than 55 Percent—Frank H. Brock and Clifford E. Smith, to A. E. Staley Mfg. Co., Decatur, Ill. No. 2,410,264. Oct. 29, 1946.

Starch in Acidified Water Suspension Made Soluble by Action of Inorganic Chlorite in Presence of Activating Agent—George P. Vincent, Briarcliff Manor, N. Y. to Mathieson Alkali Works, Inc., New York, N. Y. No. 2,409,085. Oct. 8, 1946.

Sweetening Agent Made by Acidifying and Grinding Fruit Material, Treating With Alkaline Precipitating Agent, Filtering and Clarifying to Give Clear Liquid—Arvid M. Erickson, San Jose and John D. Ryan, Campbell, Calif. to Barron-Gray Packing Co., San Jose, Calif. No. 2,408,418. Oct. 1, 1946.

VITAMINS

Fat-Soluble Vitamins and Pro-Vitamins Extracted From Organic Material Without Inclusion of Chlorophyll—William R. Graham, Jr., Kansas City and George O. Kohler, Mission, Kansas and Richard D. Hoover, Kansas City, Mo. to American Dairies, Inc., Kansas City, Mo. and Quaker Oats Co., Chicago, Ill. No. 2,408,625. Oct. 1, 1946.

MISCELLANEOUS

Italian Cheese Curd Mechanically Mixed and Kneaded to Lower Production Costs and Improve Quality—Paul Sartori, Plymouth, Wis. No. 2,407,617. Sept. 10, 1946.

Meat Tenderized by Mechanical Means—Arthur H. Ahrndt to U. S. Slicing Machine Co., La Porte, Ind. Nos. 2,408,747 and 2,409,463, Oct. 8, 1946.

Solid, Dry and Stable Invertase Prepared From Pressed Yeast—Carl A. Neuberg, New York and Irene S. Roberts, Fieldston, N. Y., to Sun Chemical Corp., New York, N. Y. No. 2,406,624. Aug. 27, 1946.

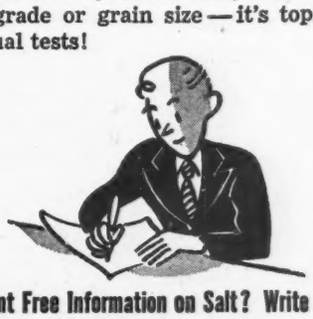
HOW TO SEPARATE A CAT FROM A MOUSE

● Simply a matter of screening . . . a useful trick for a mouse to know. In fact, screening is a useful trick in any trade. . . . even the salt business!

You see, in the salt business we've got to fit the salt to the job. Butter-makers don't want large, slow-dissolving crystals in Butter Salt. We remove the "big ones" so completely, you won't find even a trace on a 28-mesh Tylor screen. But they don't want fine dust, either, to cause pasting in the churn. Diamond Crystal Butter Salt contains only 3% of particles small enough to pass through a 65-mesh screen!

Yes, it's as vital to the butter-maker that we remove over-sized and under-sized salt crystals . . . as it is to the mouse to screen out that cat. (Well, *almost* as vital!)

Happily for the mouse, he got results. And so do we at Diamond Crystal. That's why you can always be sure of clean screening whenever you specify Diamond Crystal. Take your choice of grade or grain size—it's tops by actual tests!



Want Free Information on Salt? Write Us!

If *you* have a salt problem, let our Technical Director help! Just drop him a line in care of Diamond Crystal Salt, Dept. **J-11**, St. Clair, Michigan.

DIAMOND CRYSTAL
ALBERGER PROCESS SALT

BASIC FLAVOR MATERIALS

FOR FOOD PRODUCTS MANUFACTURE

Solid Extracts

ST. JOHNS BREAD
SWEET ORANGE PEEL
LICORICE
FOENUGREEK
KOLA
MAPLE BASE
COFFEE

Oleoresins

CAPSICUM
GINGER
PAPRIKA
PARSLEY SEED
TONKA

ESSENTIAL OILS • AROMATIC CHEMICALS • SPICES
GUMS: TRAGACANTH, ARABIC, KARAYA, LOCUST

S. B. PENICK & COMPANY
50 Church Street, New York 7, N. Y. Telephone: COrtlandt 7-1970
735 W. Division St., Chicago 10, Ill. Telephone: MOHawk 5651

Lo-Bax is "fast on the trigger" . . . quickly kills bacteria that threaten the quality of your food products.

Lo-Bax, the concentrated, efficient chlorine bactericide, helps prevent costly food spoilage and improves quality standards by rigidly controlling bacteria and sanitizing all surfaces with which food comes in contact.

Easy to handle, Lo-Bax kills bacteria almost instantly . . . at low cost. It contains 50% available chlorine, dissolves quickly in water—hot or cold, hard or soft—to make clear rinse solutions.

To make certain that you have safe, sure control over bacteria, order Lo-Bax from your supplier today.

THE MATHIESON ALKALI WORKS (INC.)
60 EAST 42nd ST. • New York 17, N. Y.
Pioneer Manufacturers of Chlorine Products for Nearly Fifty Years

LO-BAX
CHLORINE BACTERICIDE
50% AVAILABLE CHLORINE

LO-BAX SPECIAL—a superior chlorine bactericide in granular form—packed in 2½-lb. bottles, ½ doz. to the case; and in 1-lb. bottles, 1 doz. to the case.

LO-BAX POWDER—a highly efficient chlorine bactericide packed in 1¾-lb. bottles, 1 doz. to the case.

Lo-Bax . . . Super-Nufos . . . HTH-15 Dry Ice . . . Carbonic Gas . . . Ammonia, Anhydrous & Aqua . . . Caustic Soda . . . Soda Ash . . . Bicarbonate of Soda . . . Liquid Chlorine . . . Chlorine Dioxide . . . PH-Plus . . . Synthetic Salt Cake . . . Sodium Chlorite Products . . . Sodium Methylate

Mathieson
LO-BAX

Flash Freezing

(*Continued from page 77*)

there is a tendency toward foaming which is completely eliminated when using flash frozen beets instead of fresh.

Economics of the Method

To illustrate the economic advantage of using flash frozen foods let us take celery, which is an ingredient in soups and similar items, as an example. For obvious reasons packers prefer to extend their packing operation for their year's requirements beyond the short harvesting season. This may be done in one of three ways:

(1) Purchase their year's requirements of home grown celery in season, store in local cold storage and draw from it as needed; (2) Purchase home grown celery until end of season, then go to distant markets for requirements to operate the balance of the year; or (3) Purchase the year's requirement of home grown celery, trim, freeze in bulk—move to frozen storage and draw as required.

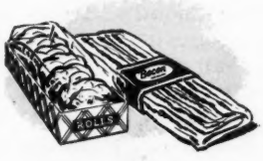
Table I tabulates typical costs for each of the above methods. It will be noted that home grown celery in season is usually the most economical. However, when this is put in cold storage for future use, after a couple of months in storage it deteriorates appreciably, thus raising the cost per pound of trimmed celery because of the poor yield. Similarly fresh celery from distant markets, while the yield is even better than the home grown because it is better trimmed, is high in cost. Contrasted with these two methods are some figures secured from an operation where the home grown celery was trimmed, flash frozen and stored.

Summary

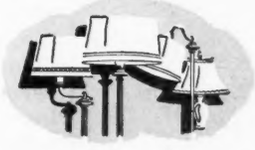
Steam blanching, used in flash freezing, causes less leaching of vitamins and of minerals than the conventional water blanching. The tendency to oxidative change in the foods is minimized, due to the reduced amount of oxygen present during the steam blanching. Immediately after blanching, and without exposing the food to the action of atmospheric oxygen, micro-organisms and reinfection, the blanched food is precooled by promptly applying vacuum. This set of conditions produces a lower bacterial content product than that resulting with any other known commercial method. In addition,

From the Rhinelander Notebook

Once a nibbling tidbit now an important staple food, 200,000,000 pounds of potato chips are made yearly. To counteract moisture . . . the chip's eternal enemy, Rhinelander makes some of the finest, tightest papers known to the potato chip industry.



Labels printed on Rhinelander Snowdrift glassine (white opaque) have the sparkle of varnish (but eliminate its cost). They are also *greaseproof*—suggesting a wide use for *meats, baked goods,* etc. Heat-sealing, too, if desired.



The rich translucence of expensive parchment reproduced at low cost by *Lamiluxe*—Rhinelander's *multi-ply laminated glassine.* This fascinating material will be available again for lamp shades and a hundred other uses as soon as glassine supplies permit.

Fine meat off the range poses dozens of tricky packaging worries. For years the Packers have relied on the *special properties of Rhinelander G and G Task Papers** to help solve the meat industry's many problems of protection and merchandising.

Window Envelopes speed the mail, cut stenographic costs, streamline office routine. Rhinelander Paper Company has perfected special glassine for this use *—super transparent, durable* and *velvet-smooth* on *production lines.*

Wet and oily are the mackerel and the cod. The perishable goodness of huge tonnages of seafood gets fine protection from *G and G Task Papers**—through such vital qualities as *greaseproofness, odor control, wet strength*—and *moisture retention in freezing.*

**Glassine and Greaseproof—the functional papers that do so many tough jobs well*

Rhinelander
PAPER COMPANY

IN THE LAND O'LAKES. MILLS AT RHINELANDER, WIS.

Round corner construction in Blickman stainless steel processing equipment lowers cleaning time—reduces maintenance costs.

when you buy STAINLESS STEEL PROCESSING EQUIPMENT *get maximum saving in cleaning time*

Faster cleaning for your stainless steel vessel means this: you reduce maintenance costs and increase the time your equipment can be kept in productive operation. *Round corner construction* will help you achieve this objective.

Even the best brushes require extra time to clear accumulations gathered in a vessel with square corners. When gummy substances or materials that harden are used, it may be almost impossible to clean them from square corners.

S. Blickman, Inc. has developed the technique of round corner construction to a high degree — providing you with equipment that will clean more quickly — at lower cost.

To get *all* the advantages of stainless steel equipment, consult with us.

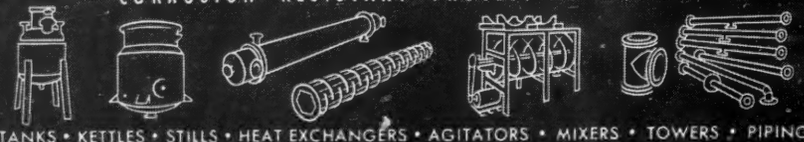
S. BLICKMAN, INC. • GREGORY AVENUE • WEEHAWKEN, N. J.

S. BLICKMAN, INC. *Guards Alloys in Fabrication*

SEND FOR THIS VALUABLE BOOK

A request on your letterhead will bring our guide, "What to Look For When You Specify Stainless Steel for Your Processing Equipment."

CORROSION RESISTANT PROCESSING EQUIPMENT



TANKS • KETTLES • STILLS • HEAT EXCHANGERS • AGITATORS • MIXERS • TOWERS • PIPING

overblanching is eliminated due to the promptness of precooling and the complete automatic elimination of the time lag between blanching and freezing. This results in greater retention of flavor, color and vitamin C. Flash frozen foods should be stored at the usual storage temperature considered safe for ordinary frozen foods. The method has proven itself economically sound and technologically capable of producing frozen products entirely different from those obtained by other methods of freezing foods.

—End—

Potato Peeling

(*Continued from page* 108)

In the only plant where the brine method was employed the digestive action was so poor that a continuous abrasive peeler was hooked on to the line, following the brine tank, to mechanically remove the peel adhering to the stock after it had been put through the tank.

Some 315,257 lb. 100 percent U. S. No. 1 raw potatoes were put through, yielding 28,283 lb. 94 percent dehydrated potatoes over a period of about 4 months. By using the same reconstituting formula as before, an overall efficiency of 53.6 percent is secured. This results in a loss of 46.4 percent. Calculated on a 40 percent U. S. No. 1 stock basis, the loss amounts to 73.4 percent. Table I is a recapitulation of all of the above data in correlated form. It shows that, on a 100 percent U. S. No. 1 potato basis, the following recoveries were produced:

	Percent
Abrasive peeling, poor stock	66.8
Abrasive peeling, good stock	69.7
Steam batch peeling	73.8
High temperature lye peeling	85.0
Brine peeling	53.6

These figures were secured from actual large scale operation from firms who produced most efficiently with each of the respective methods. It must be borne in mind that the above efficiencies all include losses other than peeling and trimming. Therefore actually they would all be somewhat improved had the losses for each step been available. Since this factor is present in each of the methods its effect is equal in all of them. Hence the trend shown is a significant one.

References:

1. "Vegetable Peeler," *Food Industries*, p. 105, June, 1943.
2. L. Charles Mazzola, "New Caustic

America starts its day

with these FAMED CEREALS —

MALTEX GRAPE-NUTS FLAKES
MALT-O-MEAL KELLOGGS PEP WHEATIES
RICE KRISPIES CREAM OF RICE
CREAM OF WHEAT POST TOASTIES
CLAPP'S INSTANT OATMEAL WHEATENA
MILLER'S 40% BRAN FLAKES
PILLSBURY'S FARINA SHREDDED RALSTON
NABISCO 100% BRAN CHEERIOATS
QUAKER OATS
MILLER'S CORN FLAKES COCO-WHEATS
CHECKR-CORN FLAKES
ERNST BRAN FLAKES WHEAT CRACKLES
GERBER'S CEREAL FOOD KIX
ALBERS CORN FLAKES

Installation of Pneumatic automatic packaging equipment in cereal plant of General Mills, Inc., Buffalo, N.Y.

packaged in large part by PNEUMATIC MACHINES

You can take the word of America's leading cereal houses—Pneumatic machines mean packaging economy. It is something more than mere chance that most of the largest producers in the cereal field rely in large part on Pneumatic equipment.

That "something" is simply the fact that in every smallest detail of their design and construction Pneumatic machines are built with one idea uppermost in mind—to operate at a "lower cost per container." They are precision built to save money. They save it by eliminating troublesome and expensive mechanical failure, by preventing waste of your product and packaging materials, and by consistently operating at their promised rate of output for years on end.

They have been doing just that for many years in many different fields, with a dependability that warrants your consideration . . . Call in a Pneumatic representative. PNEUMATIC SCALE CORPORATION, LTD., 71 Newport Avenue, No. Quincy 71, Massachusetts. Branch Offices in New York, N. Y.; Chicago, Illinois; San Francisco, California; Los Angeles, California.

PNEUMATIC LOWER COST PER CONTAINER

PACKAGING AND BOTTLING MACHINERY

Over eighty different machines for the packaging of dry, free-flowing products and the cleaning, filling, capping and labeling of containers for liquids and semi-liquids

Because of their Better Quality

LUNKENHEIMER VALVES

cost us LESS per Year of Service!

In buying a valve, as in buying anything else, it's *value* you're really after.

What is the measure of valve value? Length of service life, efficiency of performance, time and expense required for maintenance . . . these are the principal factors.

In these and in all other elements of value, Lunkenheimer Valves have long proved their superior worth throughout American industry. Maintenance men everywhere rely implicitly on these *better valves* because they know they are *better values . . . quality-built* in every detail, assuring longer and more efficient service with the very minimum of maintenance trouble and expense.

For Better Valve Values, Specify Lunkenheimer!

THE LUNKENHEIMER CO., Cincinnati 14, Ohio, U. S. A.
New York 13, Chicago 6, Boston 10, Philadelphia 7.
Export Department: 318-322 Hudson St., New York 13, N. Y.

See Your LUNKENHEIMER Distributor

Lunkenheimer Distributors are located in the principal industrial centers. There is one near you fully equipped to assist with your maintenance and operation problems. Call on him.

BRONZE, IRON, STEEL, AND CORROSION RESISTANT ALLOY VALVES—
AIR DEVICES, LUBRICATORS, AIRCRAFT FITTINGS

Peeling Method Reduces Waste and Saves Labor," *Food Industries*, p. 53, January, 1943.
3. Anon, "Value of Brine Peeling Tested," *Food Industries*, p. 51, June, 1943.
4. "Continuous Steam Peeler," *Food Industries*, p. 141, May, 1945.
5. J. C. Lankler, O. M. Morgan, "How Wetting Agent Improves the Chemical Peeling Process," *Food Industries*, p. 74, Nov., 1944.
6. L. V. Burton, "Dehydrator Uses New Technics," *Food Industries*, p. 59, Nov., 1943.
7. Ray L. Dunlap, "Lye Peeling Pays Off," *Food Industries*, p. 73, Dec., 1944.

—End—

Frozen Pork Sausage

(*Continued from page* 96)

pork fat became rancid. Whether it is the salt, metallic impurities in the salt or natural spices or a combination of salt and metallic impurities in the product that accelerates rancidity is not yet known.

By omitting salt from the formula, product quality was maintained over a six months' period. The color of the lean meat remained a bright red, and in no instance was there any discoloration. Despite the fact that the flavor of the sausages was bland, it was found sweet and non-rancid. Results of salt-free sausages are given in Table I.

The lean meat in all other eight lots of frozen pork sausages discolored within one month. This discoloration became pronounced as the period of storage increased. Rancid conditions were noted after three and four months of storage.

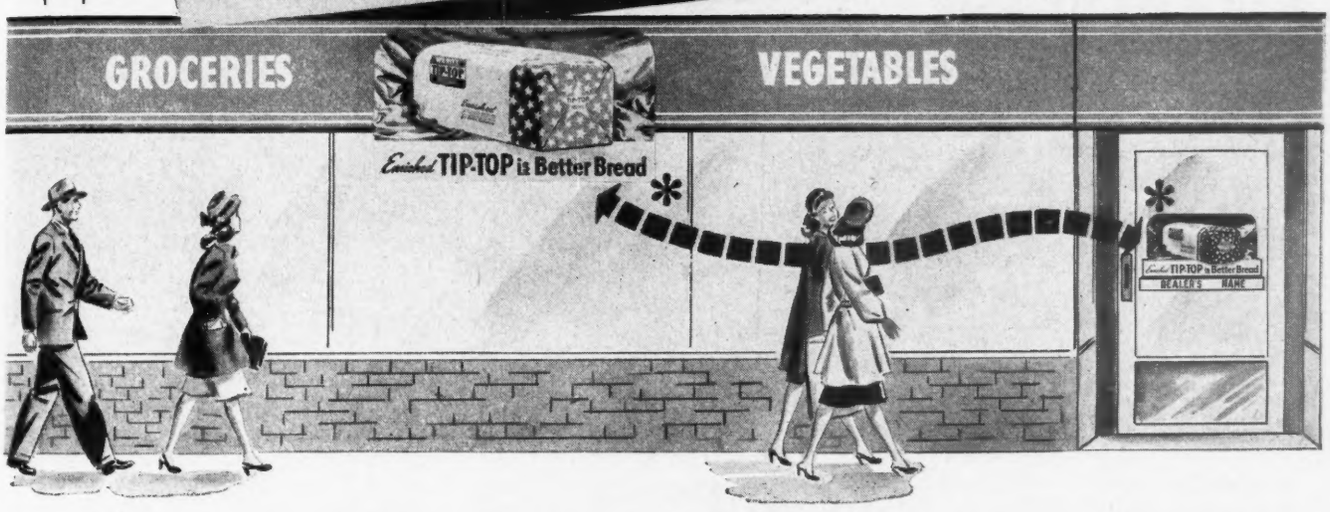
Antioxidant Ineffective

Treating pork sausage links containing salt with the antioxidant, NDGA, and citric acid did not extend the shelf-life of the product when packed in regular waxed paper lined pork sausage link cartons. Discoloration of the lean meat took place within one month, becoming progressively worse with prolonged storage. At the end of the third month, judges detected a slight rancid odor and flavor in cooked samples. No material advantage was accomplished by treating the sausage meat with the antioxidant and subsequently packing in tins under vacuum or gas-packing in nitrogen or carbon dioxide.

Vacuum- and Gas-Packing

Packing pork sausage links in tin cans under vacuum or in an atmosphere of inert gases produced unexpected results. In all three lots the lean meat took on a grayish discoloration. Actually the discoloration was more pronounced than sausages packed according to the conventional method. Rancid odors and flavors were detected between

A "TIP-TOP" Point of Sale PROGRAM on MAIN STREET!



with MEYERCORD DECAL Valances and Window Signs

* *Tip-Top Bread captures tip-top display space free on thousands of store fronts with Meyercord Decals. Ward Baking Co. uses a complete Meyercord program: personalized Dealer-Name Decals... colorful window valances... merchandise description panels... plus the same vivid, loaf-of-bread trademark on trucks. A smash hit!*

ON WARD'S TRUCKS TOO!
Ward's famous Signs in Action As Mobile Billboards

Meyercord Decals stimulate *action* where action counts—at the point of sale! Dealers welcome them because they attract customers . . . sales . . . profit. Advertisers like them because they provide lasting, colorful, economical dealer identification. Decals personalized by unique Meyercord methods win preferred space on America's Main Street. Display your product name, brand or trademark in winning combination with Meyercord Decals. They're washable, durable, easy to apply, in any colors, size, design. For details, write today. Address Dept. 65-12

• ADVERTISE
• IDENTIFY
• DECORATE
your products with
MEYERCORD DECALS

THE MEYERCORD CO.

World's Largest Decalcomania Manufacturer

5323 WEST LAKE STREET • • • CHICAGO 44, ILLINOIS

WHY PUSH WHEN YOU CAN CONVEY

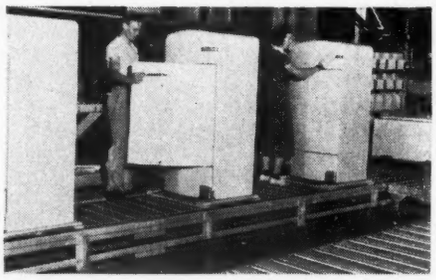
Pushing material around is not only slow, hard work — it's costly material handling — there's an easy way to do it.

Investigate the use of conveyors. Conveyors handle a wide variety of parts, packages, units, cans, bottles, barrels, bundles, drums and boxes. Available in light, medium or heavy-duty types — portable or stationary — as systems, sections or units — power or gravity fed, they give you remarkable savings in time, money and manpower conservation. They relieve confusion and congestion.

Standard Conveyor Company has the experience and facilities to engineer, recommend and furnish the right type of conveyor for your particular needs.

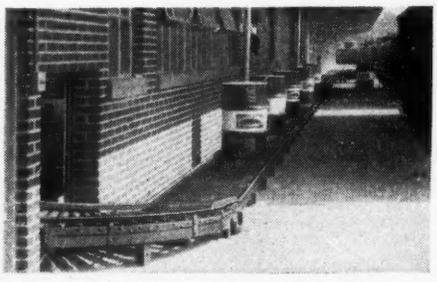
Write today for Catalog No. FI-126 "Conveyors by Standard"—a ready reference on conveyor types and systems.

STANDARD CONVEYOR CO.
General Offices: North St. Paul 9, Minn.
Sales & Service in Principal Cities

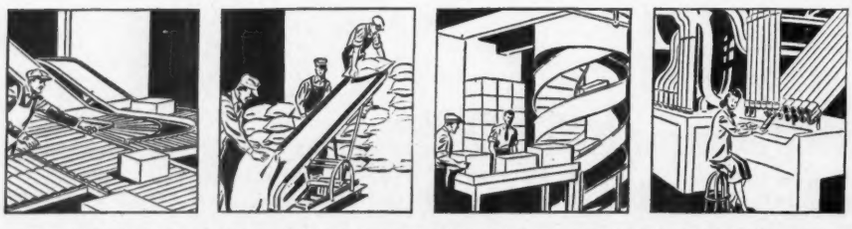


PRODUCTION LINES
Slat type conveyor used to speed assembly and crating of refrigerators.

STORAGE AREAS
Portable "Handibilt" conveyors used as a continuous conveyor line in storage area.



LOADING PLATFORM
Oil drums leave the warehouse for loading into boxcars on gravity roller system.



ROLLER - BELT - SLAT - PUSHBAR CONVEYORS • PORTABLE CONVEYORS AND PILERS • SPIRAL CHUTES • PNEUMATIC TUBE SYSTEMS

the third and fourth month. There was no preference in the manner in which pork sausages were packed in tins. Results were the same when sausages were packed under vacuum or with the inert gases, nitrogen or carbon dioxide. The results of vacuum- and gas-packing in tins are given in Table II.

Chemical Tests Not Significant

Free fatty acid and peroxide values, determined at monthly intervals, showed nothing significant at the end of four months. Results are shown in Table III. Judges, with considerable pork sausage tasting experience, were able to detect rancid conditions after three months, despite the fact that there was no correlation with chemical results. It was impossible to detect differences in the method of treatment or the type of packaging of frozen pork sausages over a four months' holding period based on chemical analysis.

Summary

Methods of treating and packing frozen pork sausage links were studied during freezer storage. Pilot plant scale tests showed the following results:

1. Lean meat discoloration and rancidification of pork fat over a six-months' storage period was prevented by excluding salt from the formula. This suggests the possibility of freezing pork sausage meat with salt omitted from the formula, holding it in cold storage when the market is glutted, then replacing the salt after defrosting the sausage meat prior to linking when there is a market for sausages. By so doing, production can be leveled off and supplies available to meet market needs.

2. Packaging spiced and salted pork sausage links in regular pork sausage cartons with waxed paper liners resulted in a grayish discoloration of the lean meat within one month and the development of a rancid flavor and odor within three months.

3. Packing spiced and salted pork sausage links in enamel-lined tin cans with air excluded by means of vacuum-packing or the replacement of air with the inert gases, nitrogen and carbon dioxide, proved unsatisfactory. Discoloration was more pronounced than the control or conventional style package within one month, and rancid conditions developed within three to four months. There was no preference in any of the three methods of packing in tins.

4. Treating pork sausage meat

FABLES and FACTS about FOODS and flavors

Copr. 1946 by F. B., Inc., N. Y.

GROUND HUMAN BONES and powdered chalk were alleged to have been used at various times as an adulterant of flour in bread. A reminder of this is found in the old ditty: "Fe Fi Fo Fum, I smell the blood of an Englishman . . . Be he alive or be he dead, I'll grind his bones to make my bread."

—F. B., Inc.—

SEAL, WHALE AND PORPOISE MEATS were not uncommon articles of diet in Medieval England.

—F. B., Inc.—

FROM THE TASTELESS SEED PODS OF AN ORCHID comes one of the most delightful flavors known . . vanilla! The long curing process by which the unique flavor of the dried, full-grown, unripe fruit of *Vanilla plantifolia* is developed was perfected by the natives of Mexico and Central America centuries before Columbus' landings in the Western Hemisphere.

—F. B., Inc.—

. . . AND FROM THE FRITZSCHE LABORATORIES come vanillas of peak perfection . . . Pure Vanilla Concentrate for manufacture of the finest vanilla extracts, and numerous imitation vanillas, as well as specially prepared vanillas in various types and concentrations, made to fulfill certain specific requirements not met by our regular Vanillas.

—F. B., Inc.—

SOME OLIVES, dug out of the ruins of Pompeii in 1826, were nearly perfect in color and form. Only the oil in which they were packed was rancid.

—F. B., Inc.—

TO IMPART THE FLAVOR OF OLIVE OIL to edible vegetable oils, use FRITZBRO OLIVAROME IMITATION . . . inexpensive, excellent duplication and will not spoil.

—F. B., Inc.—

THE FIRST PATENT ON DRIED FOOD was taken out in England in 1780.

PEOPLES THROUGHOUT THE WORLD have set up many odd customs regarding what should be eaten and what should not. There are non-meat eating tribes or castes in India, in Africa and in remote sections of the Americas. There are others who ban the consumption of vegetables, while in parts of Tasmania, Asia and Africa, fish eating is completely prohibited.

—F. B., Inc.—

PICKLED FISH TAKES ON IMPROVED FLAVOR when small quantities of FRITZSCHE WINE ESSENCES and special spicing compounds are added to the pickling brine.

—F. B., Inc.—

THE DEXTERITY OF ROMAN COOKS is attested by the fact that they could serve a pig or boar temptingly prepared — one side roasted, the other broiled!

—F. B., Inc.—

WHEN THE TARTAR HORDES swept over Europe seven centuries ago, their principal item of food was mare's milk, freshly supplied each day by the steeds they rode to conquest.

—F. B., Inc.—

SO ENORMOUS WERE THE MEALS eaten by churchmen in the Middle Ages that, in 1541, a constraining order had to be put into effect limiting the Archbishops to six flesh dishes, followed by no more than four "second" dishes per noonday meal. A sliding scale was provided for lesser ranks of the clergy.

—F. B., Inc.—

SPICE OILS HAVE BEEN USED instead of dried spices in many of the Christmas fruit cakes, mince meats and puddings that will be eaten during the coming Holiday Season. And not a few of these toothsome delicacies will have had their flavors greatly improved by the addition of certain very interesting Fritzsche flavors. These include: OIL RUM JAMAICA IMITATION, OIL BRANDY FLAVOR IMITATION and OIL MINCE MEAT SPICE. Bakers and confectioners will do well to make a note of this flavoring tip for use in next year's Yuletide specialties!

—F. B., Inc.—

. . . And while we're on the subject, A VERY MERRY CHRISTMAS and HAPPY NEW YEAR to you all!

Est. 1871

FRITZSCHE BROTHERS, Inc.

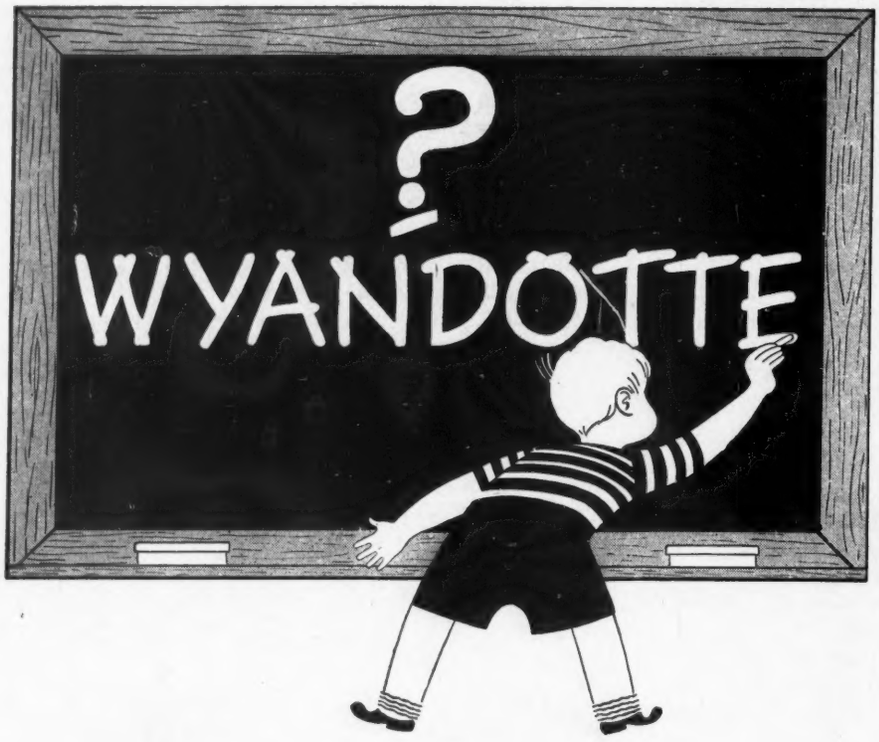
PORT AUTHORITY COMMERCE BLDG., 76 NINTH AVENUE, NEW YORK 11, N.Y.

BRANCH STOCKS

BOSTON CHICAGO LOS ANGELES ST. LOUIS TORONTO, CANADA MEXICO, D. F.

FACTORIES AT CLIFTON, N. J. AND SEILLANS (VAR) FRANCE

No matter what your cleaning problem may be— the answer is Wyandotte



YES, the Wyandotte line of cleaners is complete with products for any kind of cleaning job—whether it's on food equipment or in the department of building maintenance. Regardless of your plant or water conditions, you can depend on these specialized Wyandotte products for *thorough* cleaning.

Then—for a final germicidal treatment—use Wyandotte Steri-Chlor* as a rinse or spray. It's the last word in sanitation. Germs don't stand a chance against it.

For helpful advice on any cleaning problem, call the Wyandotte Representative. He's always at your service.

*Registered trade-mark

Wyandotte
REG. U. S. PAT. OFF.

WYANDOTTE CHEMICALS CORPORATION • WYANDOTTE, MICHIGAN
Service Representatives in 88 Cities

with the antioxidant, NDGA, and citric acid neither prevented nor delayed discoloration or rancidification. The condition of the sausages was worse than the control.

5. No advantage was seen in treating pork sausage meat with the antioxidant, supplemented with packing in tins under vacuum or in an atmosphere of nitrogen or carbon dioxide.

6. Analysis of pork fat for free fatty acid content and peroxide values over a period of four months were not significant inasmuch as increased values were not obtained nor was there any correlation between analytical figures and organoleptic findings.

Acknowledgment

The cooperation of Glenn H. Whetzell of the Packaging Pilot Plant, of M. L. Laing of the Control Laboratory and of Misses N. Pierce and W. Murphy of the Armour & Co. Consumer Service Kitchen, are acknowledged.

—End—

Bakery Sanitation

(*Continued from page* 99)

premises must be trapped or poisoned. Probably a combination is necessary for 100 percent control. A variety of traps is available ranging from the standard spring type trap to an elaborate electronically operated trap which automatically electrocutes the rats it catches, one at a time.

While the best all around rodent control measure is poison, there is only one rat poison offered for sale which should *ever* be allowed in the bakeshop, no matter whether the work is done by the regular staff or by a licensed exterminator company. This one poison is red squill, offered either in the form of a liquid extract or a powder.

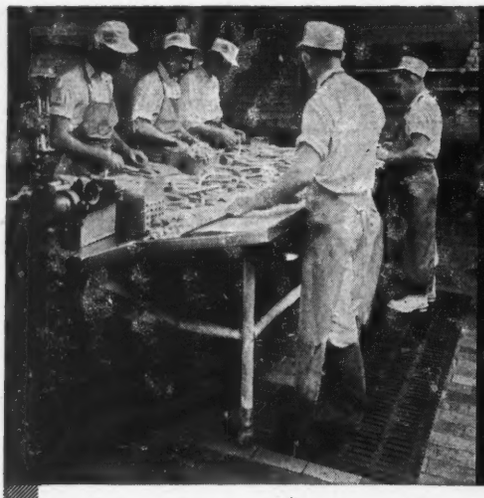
All other rat poisons act as violent stomach poisons and for that reason must not be used around foods. Red squill is also a strong poison but it is a stronger emetic and it is this property which makes it safe. Any animal, man included, which can vomit will not tolerate squill in the stomach long enough to do a serious harm. Rodents are unable to vomit, consequently red squill becomes a specific poison for them. Red squill is prepared from the bulbs of a lily-like plant found growing wild on the shores of the Mediterranean and Adriatic Seas as well as in North Africa. So far, no successful plantings have been made in

Artist—Jacob Lawrence, native of New Jersey

NEW JERSEY—*annual purchases: $3 billion—mostly packaged.*

CONTAINER CORPORATION OF AMERICA

Save Waste Paper



The ONLY Successful OIL and GREASE RESISTANT MATTING

Neo-Cord Counter-Tred

Contains no rubber
Made with Dupont Neoprene

TUF-TRED TIRE FABRIC MATTING

A long-wearing mat that provides comfort and promotes safety in wet areas. Beveled nosing on all sides. ⅝" thick, up to 6' wide, any length.

AMERICAN COUNTER-TRED MATTING

A long-wearing rubber and cord matting with a resilient non-slip surface that affords safety in wet or slippery areas. Promotes sanitation. Ridged bottom affords aeration and drainage. Easily handled for cleaning. Keeps the feet dry. ⅜" thick, 24" wide, any length.

AMERIFLEX Flexible Hardwood Link MATTING

Links are held on galvanized steel springwire framework. Lies flat. Follows contour of the floor. Beveled edges. Can be rolled or folded.
Write for prices and folder, "A Mat for Every Purpose", describing matting for promoting safety, providing comfort, reducing fatigue and furthering sanitation.

AMERICAN MAT CORPORATION

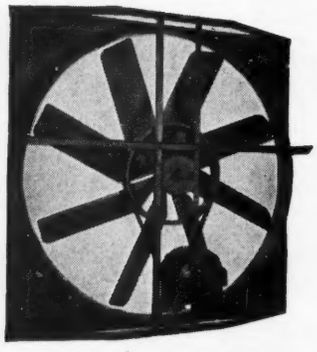
"America's Largest Matting Specialists"

1797 Adams Street • Toledo 2, Ohio

Banish Blind Spots in Ventilation . . .

WITH

Coolair
TRADE MARK



Breeze Conditioning

COOLAIR EXHAUST FANS, similar to the Type O Fan illustrated here, are now available in 16 sizes with a range in air delivery capacity from 6,200 to 48,000 cubic feet per minute. This choice of fan size and capacity, in single or multiple-unit installations, allows for scientific ventilation in a wide variety of applications.

COOLAIR ENGINEERS have for many years specialized in perfecting this one kind of equipment . . . your assurance that there will be no blind spots in a Coolair ventilating job! Your Coolair Dealer or Agent will be glad to describe Breeze Conditioning in detail, or to make a survey of your building, without obligation. Or you can get further information direct from the

ENGINEERS and ARCHITECTS
For descriptive and technical data see:
SWEET'S CATALOG FILE Architectural
SWEET'S CATALOG FILE for Builders
A.S.H.V.E. GUIDE
ELECTRICAL BUYER'S REFERENCE

AMERICAN COOLAIR CORPORATION

"Pioneer Manufacturers of V-Belt Drive Exhaust Fans"

3604 Mayflower Street Jacksonville 2, Florida

this country, leaving us dependent on imports which are quite non-uniform in strength. In order to overcome this non-uniformity, the principle processors of red squill have adopted standards proposed by the United States Department of the Interior, Wildlife Research Laboratory in 1942. This standard is based on the amount of red squill powder or concentrate needed to kill one kilogram weight of test rats. Accordingly, all preparations should be guaranteed to conform to a 500 to 600 mg./kg. strength which means that the squill has been fortified with extract in order to maintain a uniformly high toxicity.

Red squill baits may be prepared from the standardized concentrate by mixing one part with nine parts of fruits, vegetables, rolled oats, ground beef or fish. If ground beef or fish is used, one part of glycerine should be used to help preserve the meat. Best results are usually obtained by using as baits, foods which are not normally available on the premises. It is also desirable to use a variety of bait and plenty of it. The baits should be formed into small balls about the size of marbles which are distributed freely in order that all rats and mice will get a lethal dose on the first application. Once a rat has taken less than a lethal dose of squill, he will never eat it again so that trapping must then be used.

Personnel Sanitation

"Personnel sanitation" is a fundamental part of the overall subject of bakery sanitation. Needless to say, every new bakery employee should be required to pass a comprehensive physical examination which should be repeated at least once each year. No person suffering from infectious diseases should ever be allowed to handle food products. Clean uniforms should be furnished and worn at all times. Caps and hair nets will protect the product from falling hair.

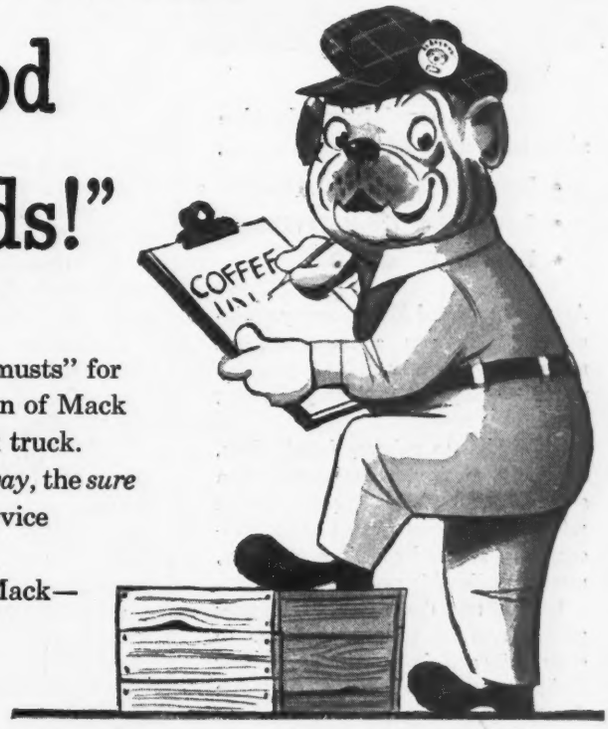
Washroom facilities should be ample, and kept clean by regular scrubbing and disinfection. Provide plenty of liquid soap and towels with positive instructions that every person wash his or her hands before starting or resuming work. Use of posters is an effective reminder to employees that a food plant is different from an ordinary factory and that the products made are meant to be eaten.

Plant Design and Maintenance

Personnel morale is boosted by clean, light working conditions. Indeed the two go hand in hand. Em-

This Mack EH is owned and operated by the Jacob Haller Company, Wholesale Grocers, Erie, Pa.

"Mack's got what Food Transportation needs!"



Dependability and speed . . . they're the important "musts" for trucks transporting perishables. They're the foundation of Mack planning . . . and the foremost features of every Mack truck.

Food handlers have come to rely on Mack as the *safe way*, the *sure way* for dependable, speedy deliveries. Mack's long-service economy boosts food transportation profits, too!

Keep pace with progress. Make your next truck a Mack—economical, efficient, harder-working with a longer life.

Mack
TRUCKS
FOR EVERY PURPOSE

Performance Counts!

Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts.

Something new in
POWDERED FOOD
RECOVERY EFFICIENCY

. . . and here is the simple basic element used.

- NO PRESSURE BUILD-UP
- MINIMUM MAINTENANCE
- EASILY CLEANED

Aerotec powdered food recovery equipment affords you a more efficient method of collecting food powders wasted during the various processing steps.

Applicable to primary installations, the Aerotec unit may also be used as a secondary in series with your present recovery equipment. The higher efficiency thus attained can, in many cases, mean unbelievable savings to you.

Let us test the efficiency of your present recovery equipment. It can be done easily and simply with the Aerotec Field Test unit, using an actual full size Aerotec tube for accuracy.

Write for Catalog No. 101.

THERMIX ENGINEERING CO.
Project and Sales Engineers
FIRST NAT'L BANK BLDG., GREENWICH, CONN.

AEROTEC CO.
WHITE PLAINS, NEW YORK

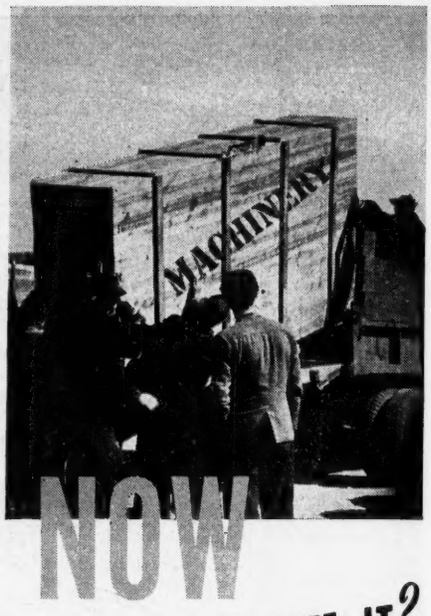
ployees never can be impressed with the need for proper sanitary practices if physical aspects of the bakery are not of such a nature that they promote cleanliness. By the same token, clean premises cannot be maintained without employee cooperation, which brings us to a consideration of plant design and maintenance. Plant design and maintenance all add up to good housekeeping and good housekeeping is the fundamental control of the four factors of contamination which we have thus far discussed. Clean ingredients, processed in a clean shop, by clean people, will produce clean products. Roaches are seldom a problem in a clean shop, while insect and rodent control are greatly simplified if basic housekeeping practices are sound.

Warehouse Storage

Warehouse storage deserves especial attention since flour is often held for several weeks before use. It picks up objectionable odors and flavors easily. Bakery taste comes usually from absorption of odors in storage, or in the bakeshop proper, or from unclean equipment. The solution to the first possibility is ventilation—not in the sense of a system which merely brings in outside air, but a system which induces a circulation of fresh air, filtered if necessary. The air inlet is preferably in ingredient storage, with the air movement being through the shop and out. Strongly odorous equipment, such as doughnut frying kettles, should be vented to the outside, with the constant thought that an otherwise good product can be ruined (consumer wise) if the flavor is not right. Dirty bake pans often contribute to "bakery flavor." The solution is a regular pan cleaning schedule, religiously followed.

Good housekeeping dictates that the building be well ventilated, and well lighted. Do not allow flour or any other ingredients to accumulate on floor or work tables. Avoid accumulations of dust and dirt on floors, in corners, or on conduits, pipelines and equipment. Strive to eliminate the production of dust wherever possible. Eliminate spots of condensation on walls and ceilings by the proper use of insulation and humidity control. White walls and equipment encourage and make easier good housekeeping.

Such are the precautions to be observed for proper bakery sanitation. They are all summed up in one sentence: Clean ingredients, warehoused and processed under sanitary conditions by clean people will produce clean bakery products.



NOW

WHO'LL LUBRICATE IT?

The LUBRIPLATE Tag Service assures the machinery manufacturer, who uses LUBRIPLATE for initial lubrication, that the machines will be serviced with the same outstanding lubricant. Machine Builders, use the Tag Plan. Machine users, mail the post cards you find on the equipment.

℞ FOR YOUR MACHINERY

No. 3 — Ideal for general oil type lubrication, ring oiled bearings, wick feeds, sight feeds and bottle oilers.

No. 8 — Because of high film strength and long life it reflects outstanding performance in most types of enclosed gears (speed reducers).

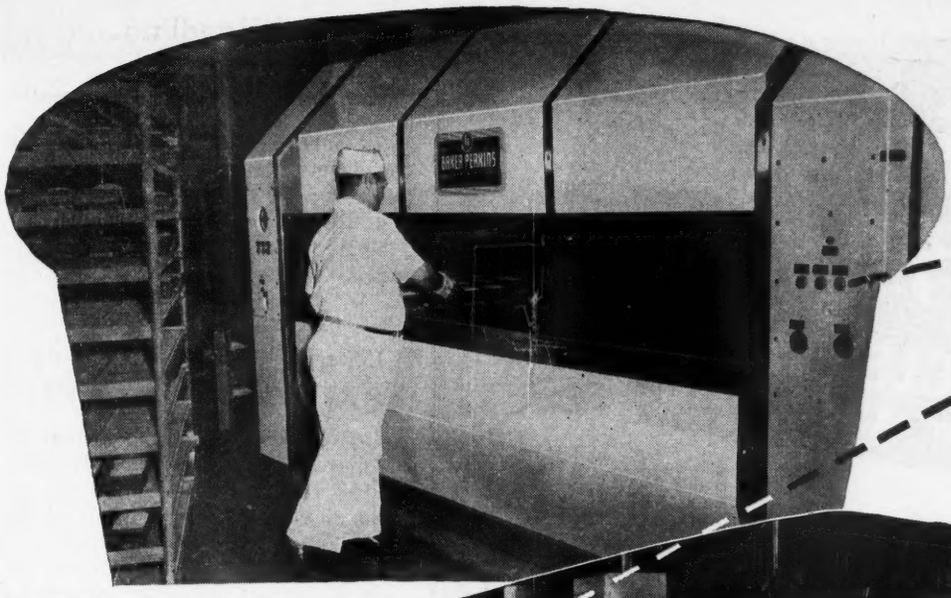
No. 107 — One of the most popular grease type products for general application by pressure gun or cups.

No. 70 — For a wide range of grease applications, especially at temperatures above 200 degrees F.

No. 130-AA — Known nationwide as the superior lubricant for open gears, heavy duty bearings, wire rope, etc.

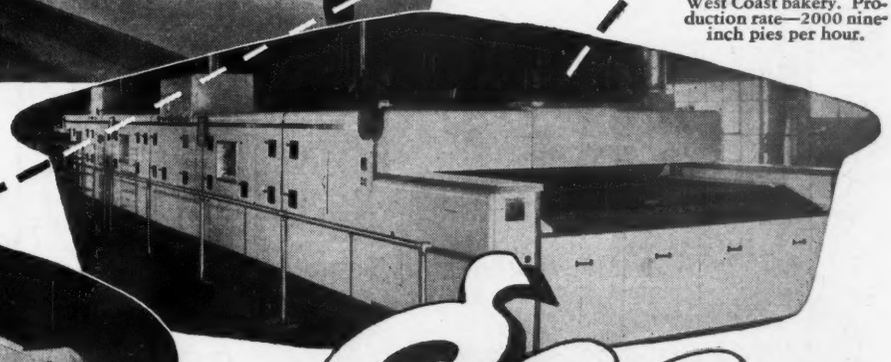
BALL BEARING — This is the LUBRIPLATE Lubricant that has achieved wide acclaim for use in the general run of ball and roller bearings operating at speeds to 5000 RPM and temperatures up to 300 degrees F.

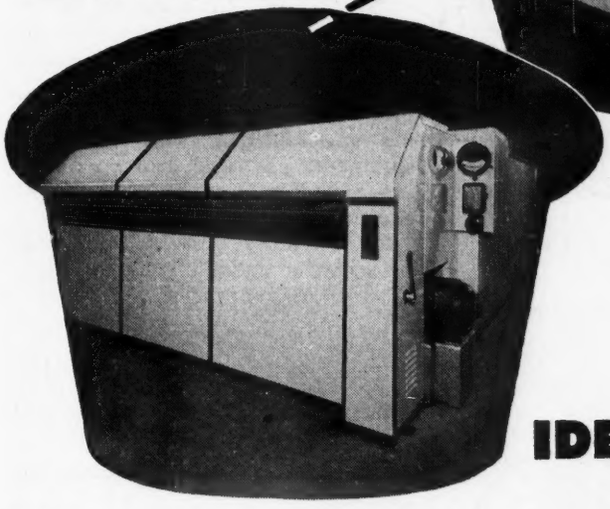
LUBRIPLATE
FISKE BROTHERS REFINING CO.
NEWARK 5, N. J. TOLEDO 3, OHIO



Baker Perkins controlled tray oven at Continental Baking Co., Norristown, Pa. Production rate—2220 one-pound loaves per hour on 35 minute baking schedule. Gas consumption—2140 cubic feet of 520 B.T.U. GAS per hour. Burner unit—Ribbon-type with diaphragm control.

Gas-fired Tunnel oven in West Coast bakery. Production rate—2000 nine-inch pies per hour.





Gas-fired multicycle diathermatic variety goods tray oven in large Eastern bakery.

Gas

IDEAL MODERNIZATION FUEL

When you set your course on a program of bakery modernization your plans are based inevitably on two objectives—better baked goods and better production.

Of course, you won't be satisfied with more and better products alone. You'll be planning for improved working conditions, for a cleaner plant, for labor-saving methods, which means you'll be planning to use GAS and modern Gas Equipment.

The dependable fuel for all modern bakery requirements, GAS fulfills every specification for cleanliness, flexibility, controllability, speed. Bakery modernization with efficient Gas-fired ovens and ranges assures better production and better baked goods.

You can obtain the latest information on GAS and modern Gas Equipment by calling your local Gas Company.

AMERICAN GAS ASSOCIATION

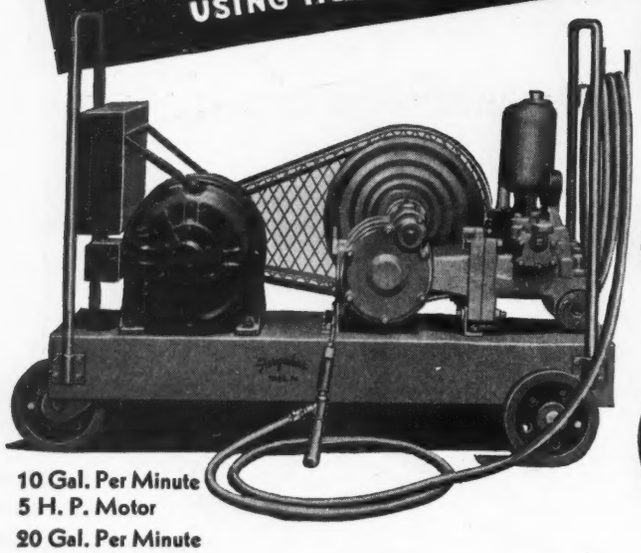
420 LEXINGTON AVENUE, NEW YORK 17, N. Y.

MORE AND MORE...

THE TREND IS TO GAS

FOR ALL COMMERCIAL BAKING

Cut Your Cleaning Costs—
WITH A Farquhar
Hi-Pressure CLEANING UNIT
USING HOT OR COLD WATER



10 Gal. Per Minute
5 H. P. Motor
20 Gal. Per Minute
7½ H. P. Motor

A Portable Cleaner for Every Job

SAVES TIME—SAVES LABOR

To clean all mobile or stationary equipment—walls, floors, tank, vats, conveyors, pasteurizers, storage bins, utensils, etc.—this time and labor saving cleaner has as many uses as you have different cleaning jobs—uses a high velocity jet of hot or cold water at pressures from 300 to 500 pounds to dislodge and sweep away accumulations of process refuse, residue and other debris.

Thousands of these hi-pressure pumps have been built by Farquhar and have proven efficient over years of operation. This cleaning unit will eliminate much tedious hand work without damage to delicate equipment. Operation is extremely simple; the high velocity jet can be directed to clean quickly large surfaces as well as out-of-the-way areas.

Accessory nozzle and suction equipment is available for use with concentrated cleaning solution where extreme conditions exist. Portable unit as shown; also available on a skid base without wheels for permanent installation.

Specialists in Machinery for Industries Since 1856

HI-PRESSURE CLEANING UNITS · HYDRAULIC JUICE PRESSES · FABRICATED VESSELS · BOILERS · SAWMILLS · AND SPECIAL MACHINERY OF ALL KINDS

1856 NINETIETH ANNIVERSARY YEAR 1946
A. B. FARQUHAR COMPANY
1290 DUKE ST. YORK, PA.

Palletized Handling

(*Continued from page* 103)

3. More economic and efficient use of mechanized handling equipment.
4. Reduced car demurrage.
5. Reduced personnel, fewer injuries, less overtime.

Additional Services

Lawrence will undertake the following in addition to exchanging pallets:

1. Promoting palletized shipments of merchandise economically handled by the fork truck-pallet system so as to reduce freight costs of the pool.
2. Working for a freight allowance on pallets so as to reduce the total freight charges on inbound palletized shipments.
3. Operating a materials handling research laboratory.
4. Assisting in securing lower trucking rates where shipper and receiver load and unload palletized shipments.
5. Assisting in securing lower tariffs on ship and barge palletized shipments.
6. Providing a materials handling engineering service for lessees.
7. Providing unbiased, scientific information on palletized operations between all industries.

—End—

Staphylococcus

(*Continued from page* 101)

animal tests. Since staphylococci grow well in many foods and have access to foods exposed to air, it would be desirable to develop methods for preventing toxin formation. At present, adequate refrigeration of perishable food is the only safeguard against staphylococcus food poisoning.

Once a food poisoning strain of staphylococcus grows in a food, it is readily spread to other foods in a single establishment as is supported by the occurrence of repeated outbreaks traced to the single establishment. Contamination may spread from one to other foods by contaminated knives and cutting boards used for several foods in succession without sterilization.

Properties of Toxin

The flavor of food containing the toxin of food poisoning staphylococci may not be abnormal. Fur-

FOR THE PREVENTION OF BROWNING OF FROZEN FRUITS

ASCORBIC ACID-CITRIC ACID MIXTURE

As soon as a fruit is peeled or sliced, it is exposed to the action of atmospheric oxygen. The first result of this exposure is the oxidation of the ascorbic acid (Vitamin C) naturally present, and as soon as this has occurred certain substances also present are next attacked causing the development of a brown color. The rates at which these oxidations take place are also greatly increased by certain enzymes present in the fruit.

Since the ascorbic acid must first be oxidized before "browning" occurs, this latter can be postponed by adding additional quantities of the ascorbic acid and naturally the more that is added the longer "browning" is delayed, although with the enzymes present, to speed up the oxidation, it will eventually occur.

Experimental work carried out in the laboratories of Chas. Pfizer & Co., Inc., has demonstrated that by adding a small amount of citric acid to the fruit the enzymes, which cause rapid oxidation, are inactivated and only a relatively small amount of ascorbic acid need be added to protect cut or frozen fruits against "browning".

Chas. Pfizer & Co., Inc., now has available an ascorbic-citric acid mixture (4% ascorbic acid U.S.P., 96% citric acid anhydrous) which combines the enzyme-inactivating effect of the citric acid with the anti-oxidant effect of ascorbic acid to give better protection against the "browning" of frozen fruits *and at a lower cost.* For further information please inquire of Chas. Pfizer & Co., Inc., 81 Maiden Lane, New York 7, N. Y.; 444 W. Grand Avenue, Chicago 10, Illinois; 605 Third Street, San Francisco 7, Calif.

PFIZER QUALITY

PFIZER

Manufacturing Chemists Since 1849

SOLKA-FLOC, a unique Brown Company product, is a finely divided, chemically purified cellulose fibre. It is steadily finding wider uses in industrial operations for both process and product improvement.

Unexcelled in purity and uniformity, SOLKA-FLOC is produced in a wide variety of physical forms giving unusual combinations of technical properties. Members of the line are unique in the filler field, being excellent binders from non-abrasive organic origin, low in specific gravity and of negligible ash content. The color range of SOLKA-FLOC is from natural cream to pure white. A variety of fibre lengths is available; bulk, apparent density, and absorbency can be controlled. This rare combination of properties has proved its merit in commercial application and SOLKA-FLOC is being profitably adapted to use in the following fields rubber, plastics, adhesives, protective coatings, ink, filtration, plastic wood, decorative coatings, cosmetics, etc.

For details on how SOLKA-FLOC may be employed to extend supplies of more critical materials, produce new or better finished products, or facilitate manufacturing operations, address our Technical Service Department. Full help will be granted gladly, regardless of the nature of your operations, and adequate samples of SOLKA-FLOC supplied.

*Reg. Trade Mark

BROWN COMPANY

FOREMOST PRODUCERS QUALITY PURIFIED CELLULOSE

PULP SALES OFFICES: 500 FIFTH AVE., NEW YORK 18, N. Y. • 465 CONGRESS ST., PORTLAND 3, ME.
110 S. DEARBORN ST., CHICAGO 3, ILL. • 58 SUTTER ST., SAN FRANCISCO 4, CAL.
BROWN CORPORATION 906 SUN LIFE BLDG. MONTREAL 2, P.Q., CANADA

thermore, cooking food may destroy the staphylococci, but not the toxin. Toxin, which had been boiled for at least 30 min., produced a reaction in a human volunteer. This property differs from the behavior of many other bacterial toxins, such as diphtheria, tetanus and botulinum toxins that are all readily destroyed at temperatures lower than boiling.

Staphylococcus food poisoning is a serious problem in industries handling perishable foods. This type of food poisoning has given rise to many medico-legal problems. Obviously, a food may be perfectly safe when it leaves the processor, but if it is not kept under adequate refrigeration staphylococcus food poisoning may occur. It is hoped that with increasing knowledge of this type of food poisoning better methods for its control may be developed.

—End—

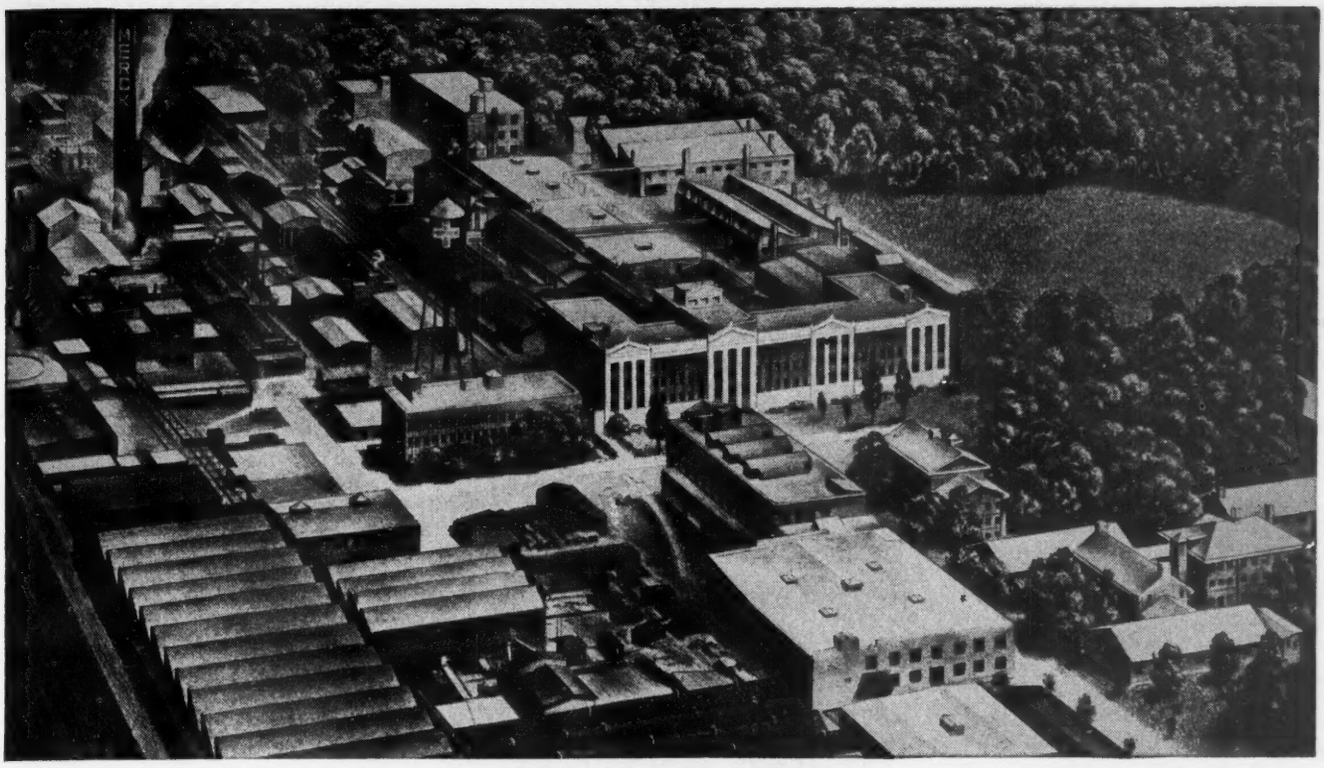
Butter Making

(*Continued from page* 105)

three cylinders discharge into a common manifold. The composition solution cylinder is of reduced capacity and its piston drive is constructed for varying that capacity. The solution is prepared from water and salt in such proportions that when mixed with the fat fraction in the control pump discharge, the resulting mixture will contain the percent fat and salt desired.

Cooling and Working

The mixture of fat and composition solution is discharged continuously into a chiller, which is an adaptation of the CP continuous ice cream freezer having two cylinders for the successive passage of the composition mixture. The mixture enters the chiller at a temperature of 140 to 150 deg. F. Combined temperature reduction and agitation solidifies the fat, while working the mass to attain smoothness of texture in the crystalline structure of the butter. The butter is discharged at a temperature between 45 and 55 deg. F. in a plastic condition, and conducted through an extruding tube in the form of a continuous advancing bar, having the cross dimensions of a standard print of butter. The bar advances into a conventional cutting machine where it is cut into prints of standard length, conveyed to a wrapping and cartoning machine from which the packaged prints are delivered ready for distribution.



Symbol of Leadership and Quality

Merck products are well known to forward-looking food processors the country over. Each product in the Merck line gives complete satisfaction . . . satisfaction founded on noteworthy performance the year round. When you use Merck products you may be sure that you are buying the best the market affords.

For the Frozen-Food and Fruit-Juice Packer

ASCORBIC ACID MERCK
(Vitamin C)

For retarding oxidation and for flavor retention in peaches, apricots, and apple juice; also for its nutritional advantages in these products.

For the Milling and Baking Industries

MERCK ENRICHMENT INGREDIENTS

MERCK VITAMIN MIXTURES FOR FLOUR ENRICHMENT

MERCK BREAD-ENRICHMENT WAFERS

Merck Bread-Enrichment Wafers are distributed by yeast companies.

For the Soft-Drink Industry

Caffeine Merck
Citric Acid Merck
Lactic Acid Merck
Lithium Chloride Merck
Lithium Citrate Merck
Phosphoric Acid Merck
Sodium Benzoate Merck
Sodium Citrate Merck
Tartaric Acid Merck

For the Manufacturing Confectioner

Citric Acid Merck
Cream of Tartar Merck
Methyl Salicylate Merck
Milk Sugar Merck
Vanillin Merck
Tartaric Acid Merck

Merck Pure Vitamins
FOR THE FOOD INDUSTRY

VITAMIN B_1 (Thiamine Hydrochloride)
Synthesized in The Merck Research Laboratories, 1936

RIBOFLAVIN (Vitamin B_2)
Made available by Merck & Co., Inc. in 1938

NIACIN (Nicotinic Acid)
Made available by Merck & Co., Inc. in 1938

ASCORBIC ACID (Vitamin C)
Made available by Merck & Co., Inc. in 1934

MERCK & CO., Inc. *Manufacturing Chemists* RAHWAY, N. J.

New York, N. Y. • Philadelphia, Pa. • St. Louis, Mo. • Elkton, Va. • Chicago, Ill. • Los Angeles, Calif.

In Canada: MERCK & CO., Ltd., Montreal • Toronto • Valleyfield

Sealed against Corrosion and Contamination

One of the largest olive packing plants in the United States experienced continuous losses due to brine corrosion in spite of constant maintenance of equipment. Even corrosion resistant alloy steel was not immune to attack. This user reports that AMERCOAT-treated equipment was unaffected by brine and that they had positive corrosion control for the first time...one of many examples of AMERCOAT'S usefulness in food industries.

Amazing Plastic Coating Gives Positive Protection

Throughout the food industry, Amercoat is saving equipment, materials, time and money for users, because it is:

— completely resistant to practically every corrosive action encountered in the food industry;

—unaffected by caustic sterilizing agents...equals glass in resistance to harboring bacteria, mold and fungi;

— non-toxic...has no taste transfer.

Get Amercoat Protection

Amercoat can be easily applied with brush or spray to concrete, wood or steel. For full details write us about your needs today.

IMMEDIATE DELIVERY

Amercoat

AMERCOAT DIVISION
American Pipe & Construction Company
DEPT. 4D
P. O. Box 3428, Terminal Annex • Los Angeles 54, Calif.

It is claimed that considerable range of body and texture is obtainable in the finished butter by accurately controlled variations of the cooling temperature, of the amount of agitation and of the rate of flow. Provision is also made for the installation of a vacuum pan between the serum separator and control pump where it is desired to apply vacuum treatment to the hot fat fraction.

—End—

Ion Exchange Plant

(*Continued from page* 80)

and the introduction of regenerant solutions and rinse water.

In the case of the Hawaiian Pineapple Co.'s operation, special resins are used which are supplied by the Chemical Process Co. They are intended to avoid difficulty with aldehyde constituents of the juice. The cycle of ion exchange and regeneration is much the same as that used for the citrus juice, however. The citrus juice requires a further processing step for the removal of glucoside, which has a bitter taste. Citrus Concentrates has developed an auxiliary process which successfully removes glucoside.

Samples of the juice prepared from citrus waste are of excellent flavor. They do not have any citrus taste, and have remained light colored in storage tests. The present plan is to use the juice as a table sirup as well as for commercial processing. One of the commercial uses is as a sweetening agent for canned grapefruit.

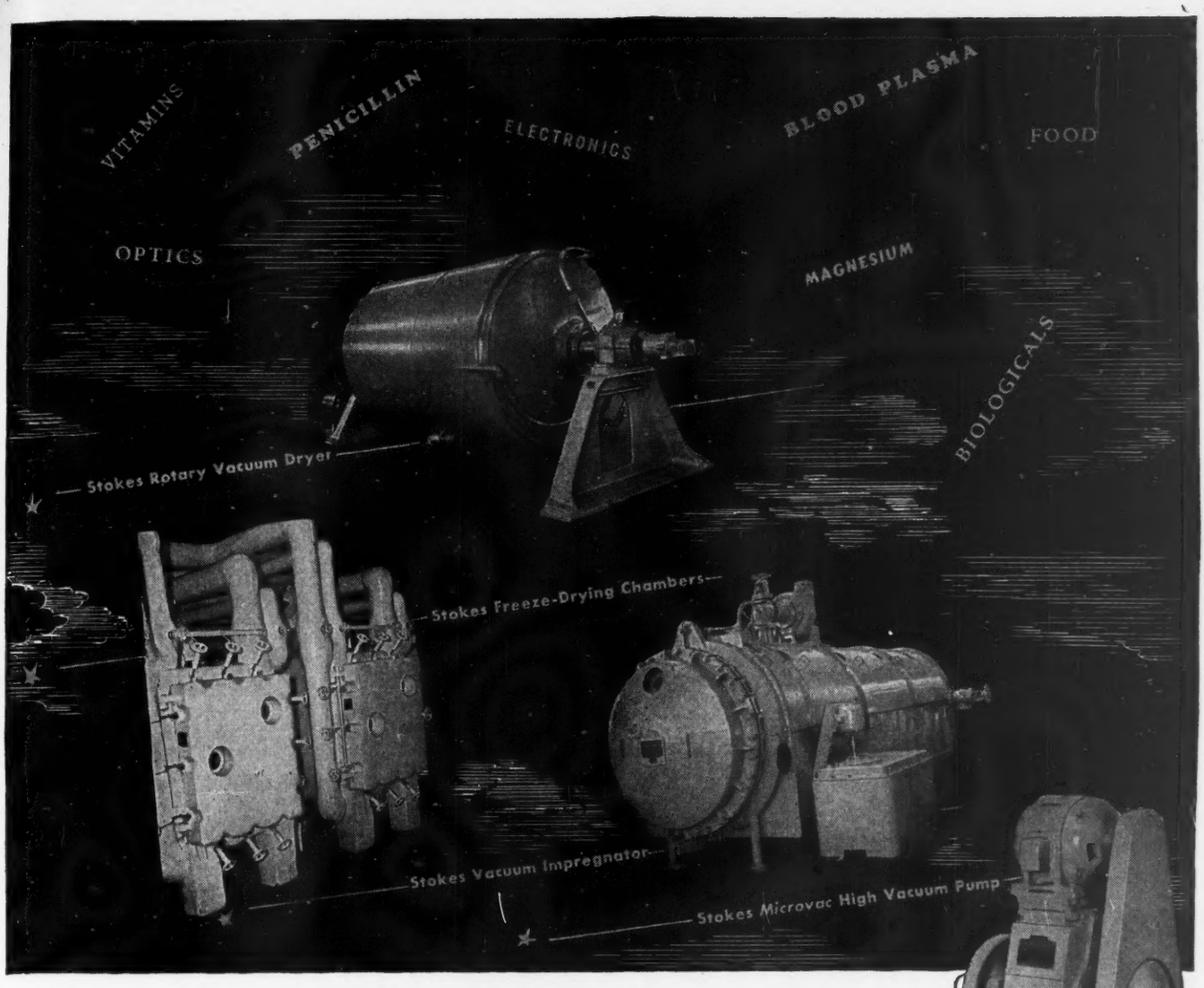
—End—

Mung Bean Sprouts

(*Continued from page* 92)

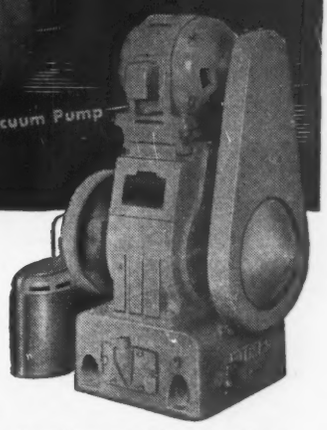
placed in cold water the sprouts become very brittle and rough handling will break them. One of the most practical methods is a series of cold water baths in tanks. The tanks are first filled with water to the overflows. A quantity of grown sprouts is placed in the first tank and stirred with a stick or the hands so as to allow the hulls to come to the surface. Some of the hulls will sink to the bottom of the tank while others will float on the top.

Water should be run into the tanks constantly and the floating hulls will pass out through the holes in the screen covering the overflow. It is not wise to place too many



THE SKY IS THE LIMIT

WITH HIGHER VACUUM PROCESSING



Take away air's restraining influence . . . and new worlds of manufacturing technique unfold.

Today higher vacuum freeze-drying processing — in the low micron range — is making possible new and startling products undreamed of yesterday.

Citrus fruit juices, for example, are sublimed into the form of crystals . . . easily packaged and preserved. Replacing the water that has been removed, instantly reconstitutes the juices . . . juices in which are retained all the delicate flavors and vitamins and food values of the tree-ripened fruits. With meats, shell fish, fruits, tomato juice, coffee, extracts, milk and food specialties, freeze-drying has proved equally successful.

Stokes' 40 years of experience in the field of high vacuum, plus a wealth of new research knowledge on sublimation, offer food processors a rich source of help in planning for tomorrow's market.

F. J. STOKES MACHINE COMPANY
5976 Tabor Road, Philadelphia 20, Pa.

F.J.Stokes *High Vacuum*
FJS Est 1895
PUMPS · GAUGES · EQUIPMENT

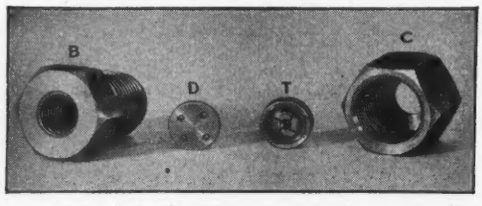
SPRAY DRYING?

Have you tried Monarch H-466 Carboloy Cemented Carbide nozzles?

This nozzle is specially designed for Spray Drying work, and for extra long life, the parts subject to wear or erosion are made of Carboloy Cemented Carbide. Other parts are made of 18-8 stainless steel to resist corrosion.

Plants powdering milk, eggs, coffee, molasses, etc., report nozzle life of 50 to 100 times that of nozzles of ordinary materials. Think of the savings resulting from the elimination of "down" time alone!

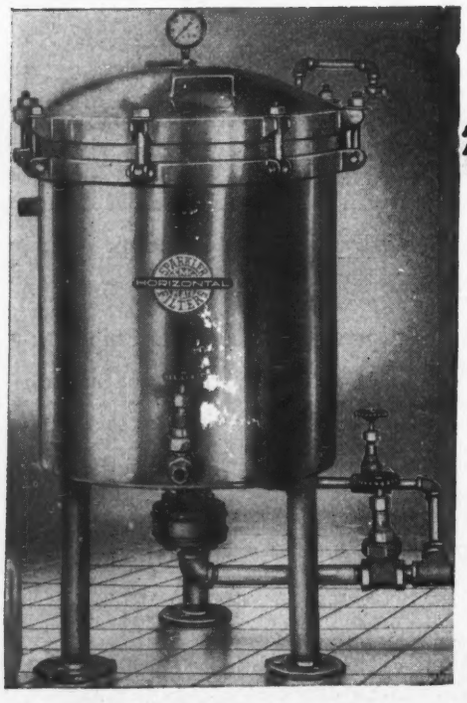
Write for Catalog 6-A



MONARCH MFG. WORKS, INC.

3307 Salmon St. Philadelphia 34, Pa.

PURITY *all the way*



Model 18-D-12 STAINLESS STEEL
Capacity 1,200 G.P.H. on clear water

Sparkler

HORIZONTAL PLATE

FILTRATION

Food liquids are filtered microscopically fine, and uniformly to the end of each cycle.

SPARKLER FILTERS provide—

- Larger filtering area for continuous operation.
- Fast Flow Rates.
- Ample freeboard for run-off of filtrate.
- Completely disposable media.
- Pressure-tight, leakproof filtration.

Many models—portable or stationary
Capacities 60 to 10,000 G.P.H.

SPARKLER MFG. CO.
278 Lake St., Mundelein, Ill.

FREE
FILTRATION
ENGINEERING
SERVICE

SPARKLER HORIZONTAL PLATE FILTERS

sprouts in the tank for, if packed too tightly, the hulls will not be permitted to rise to the surface. A good operation is to apply a fairly strong spray of water back and forth over the surface of the sprouts, as such action will not only allow the hulls to come to the surface but will also break off most of the roots which will pass out through the overflow along with the hulls.

Since it is not quite possible to remove all the hulls in a single washing, the sprouts are next transferred to the second tank where the same operations are repeated. While this is being done another batch of sprouts is placed in the first tank and so on until all three tanks are in service at one time.

Transferring the sprouts from tank to tank can be accomplished best by the use of a wire basket. The washing tank is built in three separate sections with holes near the top of each partition, each tank having an extra large drain valve to permit the passage of the hulls which sink to the bottom. In this type of construction any one of the tanks may be drained and the water changed without completely draining the others. This is done as the various tanks will require draining and change of water at different times and the first tank will require more changes of water due to the greater number of hulls settling at the bottom of it.

After removing the sprouts from the last tank they are ready for use. They can be canned or frozen satisfactorily.

Canning Sprouts

The packing, canning and processing of bean sprouts is a relatively simple operation. The sprouts can be packed by hand just as they come from the washing tanks but as they are then quite brittle they would break quite a bit in the handling. For this reason it is best to first give them a short blanching to make them flexible. The best method of packing into the cans is by use of the regular rotary hand pack machine and the usual pack for a number two can is from 12 to 14 ounces net weight. Either salt tablets of 35 grains plus clear hot water or a brine of equal salt content may be used. I have found a closing temperature of from 180 deg. F. to 190 deg. F. to be very satisfactory.

The most satisfactory length of time for recommended processing is 20 minutes at 240 deg. F.

INCENTIVES FURNISH THE DRIVE

THE COMING YEAR, 1946, and the years to follow can bring unprecedented prosperity to the people of the United States if the incentives to secure it are provided.

We have the advantage of starting with an economy which has demonstrated a capacity for expansion unequalled in any other country in the world. Our economy has demonstrated, also, one grave weakness—a recurring interruption of the upward trend of production and living standards by wasteful and paralyzing periods of recession. Recovery from each depression always has carried us to new heights of economic welfare, but the toll of the years of blight has been harmful to everyone.

The job ahead of us is a dual one. We must maintain the vitality of an economy which, over the years, has yielded an enormous increase in the American standard of living, and we also must improve its stability.

The Dynamics of American Production

In the last prewar year, 1940, the population of the United States was 3⅓ times as large as it was in 1870. But the national production, measured in dollars of constant purchasing power, was 10 times as large at the end of the period, and industrial output had increased 20-fold.

In the meantime, the average number of hours of factory workers had been reduced from about 63 per week in 1870 to less than 40 in 1940, while average hourly earnings had more than trebled in dollars of constant purchasing power. Thus "real" weekly or annual wages in manufacturing had doubled over the 70-year period, even though the work-week was cut by 35 per cent. This was made possible chiefly by a tremendous increase in the quantity and quality of the mechanical facilities which were provided in American manufacturing industry. Manufacturing capital investment per worker was multiplied by 6 times over the period in question. But the return per dollar invested, while it has fluctuated widely between good years and bad, showed no general upward trend over that portion of the period for which measurement is practicable.

Incentives in American Manufacturing

There has been, historically, a remarkably consistent pattern in the division of the realized income from the expanding manufacturing output of America. Reliable statistics are not available for as far back as 1870, but from 1899 through 1939 the average share of wages and salaries has been 82½ per cent against 17½ per cent as the share to investors (including dividends, interest, rents, royalties, and non-corporate profits). There have been, from year to year, relatively minor divergences from this pattern of distribution, but there is no discernible trend during the period away from the averages cited.

It is suggested that the persistence of the average 17½ per cent share of realized income from manufacturing that was maintained for the 40 years preceding World War II may represent the proportion that is needed to produce the dividends, interest, rents, royalties, and non-corporate return that will provide for the continuing investment upon which an expanding productivity such as we have had in the past depends. At any rate, it would seem reckless to depart too radically from such an established pattern at a time when unprecedentedly large private capital investment is counted on to make up for the drastic curtailment of such investment during the war years, and to carry us to the new high levels of civilian production set as our postwar goals.

The Distribution of Manufacturing Income in War

At the beginning of the war, the Government adopted controls and a tax program designed to prevent wartime activity from resulting in un-

duly swollen private returns. Due primarily to huge volumes, the profits *before* taxes of manufacturing industry were very high, but throughout the war its profits *after* taxes averaged returns no larger than they had been in good prewar years. Relative to volume, they were considerably lower than in prosperous years in the past. Again, there can be no complaint at results that generally were in accord with a national wartime policy.

But it is fair to note that the wages of manufacturing labor were allowed to increase substantially during the war. Between January 1, 1941 and April, 1945, average weekly earnings per worker increased by 77 per cent. This was, in considerable part, a result of increased working hours and a shift from low- to high-paid industries, but straight-time hourly earnings on the same jobs increased about 40 per cent against a cost-of-living rise of about 30 per cent.

The net result was to alter drastically the 40-year relationship of the 17½-82½ per cent division of Realized Income from Manufacturing. The share of wages and salaries increased to over 90 per cent, and the investment share shrunk to less than 10 per cent.

Its Postwar Distribution

This wartime shift in the proportion of distributive shares has an important bearing upon current wage controveries. With union demands for wage increases ranging up to 30 per cent, and the economists of the Office of War Mobilization and Reconversion asserting that an average increase of 24 per cent is feasible without raising prices, it is pertinent to inquire how such increases would affect the prewar ratios that governed realized income distribution in manufacturing.

Forecasting is always hazardous, but if we assume (1) that in 1946 we shall reach the $160 billion level of national output which the Government proponents of general wage increases expect, and (2) that there will be little increase in productivity because of the continuing process of reconversion, and (3) that the Government will succeed in carrying its announced purpose to maintain present price ceilings, it appears that a 24 per cent general wage increase would reduce the share going to capital from 17½ per cent to 11 per cent even allowing for its increased return resulting from the repeal of the excess profits tax. The prewar ratios would be about maintained if wages remained at present levels.

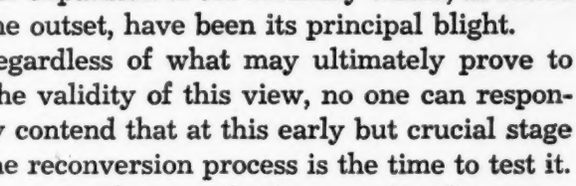
Conclusion

Since the maintenance of these prewar ratios was accompanied by an unparalleled rise in the "real wage" of American workers, there is a powerful prima facie case for not tinkering with them. It should be noted, however, that some economists think that the size of the investment share of manufacturing income tends to provide more capital than can be absorbed by a mature economy, and thus contributes to those breaks in the expansion of the economy which, as stated at the outset, have been its principal blight.

Regardless of what may ultimately prove to be the validity of this view, no one can responsibly contend that at this early but crucial stage in the reconversion process is the time to test it. Now, no one knows whether, or what dimension of, additional wage increases can be supported without forcing up prices or reducing profits to a point that will discourage vitally needed private capital investment.

We want high and increasing wages in American manufacturing. We need them to provide an active incentive to workers to support expanding productivity, as well as to continue the trend of rising living standards in America. Equally, we need a continuing profit incentive of sufficient attractiveness to call forth the new investment upon which expanding productivity depends.

We can never attain our dual objective if we push one of these aims so far and so fast that it defeats the other.



President, McGraw-Hill Publishing Co., Inc.

THE FAILURE OF "FACT-FINDING"

THE PRESIDENT has asked Congress to grant him authority to appoint fact-finding boards to deal with nationally important labor disputes. Most citizens would like to see some reasonable and objective solution of the industrial strife that now is disrupting reconversion. Unfortunately, the record of the "fact-finding" procedure indicates that any claim of impartiality for this process is a gross misrepresentation.

The Administration bill would authorize the President to appoint such boards in cases certified to him by the Secretary of Labor. Each board would report to the President "its findings of fact and such recommendations concerning the dispute as the board deems appropriate." Its facilities and staff would be provided by the Secretary of Labor. The bill provides for an interval of not more than 30 days known as a waiting or "cooling off" period during which it would be "unlawful" (though no penalties are specified) for anyone to promote or encourage work stoppages.

Because the Administration did not wait for Congressional action upon its proposal, but appointed a number of fact-finding bodies to deal with current emergency cases, we have been afforded at least a partial preview of how the procedure may be expected to work out if laws establishing it are passed.

If the reports handed down by the fact-finding panels in the General Motors and oil disputes may be regarded as representative, it can be stated conclusively that Government-appointed "fact-finding" boards will concern themselves to only a minor degree with the establishing of facts. A far greater share of their effort will be concerned with the speculative business of forecasting future output and production efficiency and appraising the "ability to pay" of the companies involved. But the predominant emphasis will be placed upon framing recommendations for settling the disputes in line with announced Government wage-price policy.

In short, the procedure essentially will be one of registering with the public a government opinion as to how far wages may be raised in the cases at issue without raising price ceilings. Both the General Motors and the Oil Panels stated, in quite explicit terms, that this was their conception of the job assigned them.

"Fact-Finding" in Auto and Oil Disputes

As the General Motors Panel phrased it: "This board subscribes to, and has been guided by, the national wage-price policy" — which it summarizes as calling for wage increases to maintain take-home pay at wartime levels, to the degree possible without inflationary price rises.

The Oil Panel was even more forthright in the statement of what it was supposed to do. "In the judgment of the panel," it declared, "the earnings of the workers must be as high as is consistent with both the maintenance of the stability of the price structure and the provision for reasonable returns to the owners of industry." In other words, prices and the return to investors are to remain fixed, with labor entitled to an ever-increasing return up to the limit of what the traffic will bear.

Having thus outlined their respective conceptions of the job, each panel proceeded to carry out its mission.

The Automobile Panel recommended that General Motors increase its basic hourly wage rates by 19½ cents, which amounts to about a 17½ per cent increase on the company's average hourly wage of $1.12. The Oil Panel recommended an 18 per cent increase in basic hourly wage rates, or an additional 21 cents to the average wage rate of $1.20.

The General Motors recommendation was based almost exclusively upon the Panel's calculation that a 19½ cent raise would keep weekly take-home pay equal to that earned in 1944 when the work-week averaged 45.6 hours. The calculation turned on an estimate of what the effective work-week was likely to be in 1946.

The Oil Panel's recommendation appears to have been based on a more complex but no more conclusive accounting. After calculating that the maintenance of July 1945 take-home pay after 40-hour shifts were restored would require a 22 per cent increase in straight-time hourly wages, it recommended that an 18 per cent increase be made. It accounted for 9½ per cent of this by noting that this was needed to cover cost-of-living rises, and explained that the rest was justified by a combination of factors including loss of premium overtime pay, higher productivity, and settlements already negotiated. Since the Panel gave no indication of the weight given to these several factors, it may not be unfair to assume that the last-named was given preponderant importance, since 18 per cent was the increase already granted in collective bargaining by Sinclair and certain other oil companies.

Higher Pay Without Higher Prices

Both panels stated that the pay increases recommended could be met without raising price ceilings, but neither documents its case on this score with very conclusive "facts".

The Oil Panel confined its observations on this account to the statements that only one company in its group had pleaded "inability to pay" and that the industry was in a generally profitable position during 1943 and 1944.

The Automotive Panel stated that, under a number of assumptions about the 1946 operations of General Motors which it believed to be valid, the Company would have higher earnings than it had in 1941, its previous record year. It specifically stated that its findings in the case were not applicable outside the

automobile industry, but it recognized that the General Motors settlement would more or less determine the settlements of other automotive companies. It stated that it had not been able to arrive at a clear conviction as to the ability of other auto makers to pay similar wage advances, but it dismissed the issue by observing that they could expect to operate at full capacity in 1946, and that this should provide savings to offset the increased wage expenditures.

From the management point of view, one of the most serious limitations in the panels' procedure was their failure to deal with any of the Company claims put forward. In ordinary collective bargaining the demands of both sides are advanced and concessions in one direction are traded for concessions in the other. Here, although the companies involved had insisted upon their need for guarantees against contract violations and wild-cat strikes, and for other union concessions, nothing but the wage issue was considered by the "fact-finding" bodies. The General Motors Panel specifically recommended that the wage increase of 19½ cents be granted, but that otherwise "the status quo prevailing before the strike be restored by the reinstatement of the 1945 contract between the parties." Handled thus, fact-finding becomes indeed a wholly one-sided exercise.

Both panels accepted, quite uncritically, the general position taken by Government spokesmen that wage increases are inflationary only if they are directly translated into price advances. It should be obvious that all wage increases add to the inflationary pressure, if made at a time like the present when consumer purchasing power far outstrips the volume of goods and services available to satisfy it.

"Fact-Finding" Dodged in Steel and Rails

It is ironic, too, that even while the Automotive and Oil Panel groups were holding the "government policy" line, the President and his Reconversion and Stabilization Directors were busily at work trying to dent it. In the steel dispute, although price rises in this industry have a particularly sharp inter-industry impact, hearings by the appointed fact-finding board were deferred while negotiations were carried forward by the President and his advisors under which the industry was offered a price increase of approximately $4.00 a ton on condition that U. S. Steel and the United Steelworkers agree upon a mutually acceptable wage boost. It is hard to avoid the cynical conclusion that wage increases constitute the major administration policy, and that the principle of not translating them into increased prices is sacred only in those cases where there can be some reasonably plausible showing that wages may be raised without price advances.

Much the same general conclusion — that the "facts" are controlling only if they support a substantial wage increase — is sustained by the history of the administration of the Railway Labor Act of 1926, often cited as a glowing example of how "fact-finding" by so-called Emergency Boards of Presidential appointees has served to prevent strikes on the railroads. It is true that reports of almost all of the 31 Emergency Boards appointed to look into threatened railway strikes in the 20 years since the act was passed have provided the basis for a settlement of the disputes in question. The fact — a real fact — remains, that in 1941 and again two years later the wage adjustments found appropriate by Emergency Boards in major railway labor disputes were revised upwards at the White House after the unions involved rejected them as unsatisfactory and threatened to strike. The second upward revision was made after government seizure of the railroads to prevent a national transportation tie-up. When the "facts" did not indicate a large enough wage increase to satisfy the union and the Administration, the "facts" went out the window.

It would be irresponsible to deny the importance of finding some tenable solution of current disputes that threaten to completely disrupt the reconversion process. But upon the evidence of experience, "fact-finding" boards cannot be expected to operate according to the common conception of their function — as agencies designed to sift out for the public an objective and significant weighing of the facts behind conflicting claims.

Without Principles Facts Mean Little

Facts, if they are assembled upon a sufficiently partisan basis, can be made to document almost any case one wishes to establish. The major difficulty in marshalling facts to resolve wage disputes is that there are no agreed-upon principles to determine the levels at which wages should be set. In the absence of such principles, it is inevitable that "fact-finding" boards, appointed by the Administration, manned largely by those who helped develop and administer Administration wage policies, and depending for technical assistance upon Administration Departments, will serve merely to implement Administration wage policy.

If Government means to reassert its wartime authority to fix wages — an objective specifically disavowed by the President and seemingly wanted by no one — it should accept the responsibility directly, rather than operate to that end through "fact-finding" boards which are independent in theory, but which cannot be so in fact.

The failure of the brand of "fact-finding" now urged upon Congress by the President is evident. Therefore, we must look for a solution along other lines.

What is needed is for labor and management to agree upon the principles that should govern the determination of wages under free collective bargaining. When such agreement is reached, then and only then, can fact-finding become an objective and useful instrument for settling wage disputes.

President, McGraw-Hill Publishing Co., Inc.

THE PRESIDENT'S WAGE-PRICE POLICY WON'T WORK

THE AMERICAN public had every right to expect that the long-awaited wage and price policy would break the impasse blocking the way to the swift and orderly reconversion of industry from war to peace.

The policy announced offers little promise of such solution, and this may well constitute a national calamity.

There is only one thoroughly constructive feature of the Presidential Statement of February 14 and its implementing Executive Order. It is the first Government pronouncement since the defeat of Japan to clearly define inflation as the major danger confronting us in the period immediately ahead.

That is a correct appraisal, and one long overdue. Up to now Government spokesmen, almost invariably, have sought to carry water on both shoulders. The Administration has justified its policy of promoting wage increases as a measure necessary to forestall deflation — to keep purchasing power from falling and forcing the economy into a violent tailspin. The strict holding-of-the-line on price ceilings has been defended as necessary to prevent runaway inflation. Unfortunately, while the President now exhorts all to enlist in a crusade against inflation with a voice that is clearly Jacob's, his program for dealing with it still employs the hairy hands of Esau to promote the very danger which he is urging everyone else to combat.

The "new" policy provides for a continuation of the wage increases that have been pressured through by Government mediators, "fact-finding" boards, and direct seizures until they have been made general throughout industry upon the dimension established in recent patterns. It offers industry the single concession of prompt hearings and decisions upon claims for price advances, but the yardsticks for judging such claims are exactly those which OPA has applied in the past. Since the past procedure has led us into our present difficulties, it is hard to see how it will serve now to lead us out of them.

Past Government Policy Fostered Dissension

At the war's end, it was obvious to everyone that what was needed was the swiftest possible reconversion of industry. It should have been equally apparent that we were faced with the difficult problem of controlling tremendous inflationary pressures which would be particularly insistent until peacetime production could be mobilized at high volume. This was made almost inevitable by the huge backlog of accumulated demand, for both capital and consumer goods, and by the unprecedented volume of liquid funds at the disposal of individuals of all classes. The only circumstance that could have modified the inflationary complexion of the postwar picture was the possibility of such wholesale and prolonged dislocation and unemployment in the process of readjustment that people would have been frightened into freezing onto their savings instead of spending them.

It soon was apparent that just the opposite was taking place. The early transition was extraordinarily swift, unemployment was lower than anyone had dared hope, and civilian spending outstripped all previous records. The circumstances called for strong anti-inflationary fiscal measures, along with a firm maintenance of price and wage controls alike.

Instead of adopting such a balanced program, the Government immediately discarded all wage controls, and in addition started an active campaign for promoting large wage increases. The President, upon a number of occasions stated flatly that American industry generally could and should grant substantial pay advances without any compensating price rises. His Office of War Mobilization and Reconversion estimated that average increases were practicable to the extent of 24 per cent. Given such Governmental encouragement, it was inevitable that labor leaders should do exactly what they did—file extravagant wage demands at the beginning of the reconversion process, when accurate appraisal of production schedules and costs were least susceptible of calculation, and when the shortage of civilian goods multiplied the inflationary effect of any increase in purchasing power.

At the same time, the OPA was fighting to hold the price line in a good cause, but with singularly inept procedure. It acted, seemingly, upon the premise that it was always better to give less price relief than was needed rather than enough, that relief provided under its formula was preferably to be granted later rather than on time, and that the interests of lower-bracket income receivers should be protected by a particularly tough resistance to raising prices of cheaper goods. The latter procedure seems to have boomeranged by virtually driving many of the lower-priced lines off the market.

The sum of these wage-price procedures resulted in work-stoppages of epidemic scope. Many business concerns faced with the prospect of immediately unprofitable operation, uncertain that new wage demands would not be made with Government support as soon as volume production was established, and without assurance as to when price controls would end, refused to assume inevitable losses even when confronted with combined union and Government pressure. The fight was on.

"New" Policy Differs Little From Old

With inflation now clearly recognized as the immediate danger, it might have been expected that the new wage policy would reverse the former practise of lending active encouragement to new wage advances. But that would have brought down upon the Administration the wrath of all organized workers who had not yet been granted increases already bargained through by other groups. This was avoided by directing the National Wage Stabilization Board in effect to approve any wage increases necessary to give general advances comparable to those already made. The only brake applied on the wage side lies in a directive to the Board not to approve, as a basis

for price relief, wage advances that go beyond the established pattern.

On the price side, the new directives to the OPA entail no important departure from its past procedures. Even the concession to review "hardship" cases promptly rather than after six months is only a pious hope, since it is unlikely that OPA is equipped to deal rapidly with the thousands of cases that will arise. A hardship case is defined as one in which, after absorbing an approved wage advance, an industry or establishment in a twelve months' period of normal-rate operation is judged by the Price Administrator likely to operate at a rate of profits to net worth less than it averaged in the base period of 1936-1939.

Let us see what this really means. In the first place, the rate of manufacturing profits in the base period was only moderate. But since the average net worth of manufacturing corporations has increased one-third over what it was in the base period, the application of the OPA formula, *assuming that its Administrator correctly appraises the twelve-month outlook,* seems to provide for absolute profits one-third higher than the 1936-1939 average.

The OPA formula, however, applies to profits *before taxes.* What really matters to stockholders is profits *after taxes.* Corporation taxes have been increased from an average of 17 per cent in the base period to 38 per cent now. This means that the price adjustments granted by OPA on average will yield profits *after taxes* no larger in dollar terms than in the 1936-1939 period, although 1946 manufacturing sales are expected to be more than twice as high. Under this procedure the *ratio* to net worth of profits *after taxes* will be one-fourth lower than the 1936-39 average. This clearly undermines the incentives upon which production at high level depends.

The workers get wage increases which promote inflation. The Government, bailed out from its previous mistakes, gets political credit for raising wages. And the entire bill is handed to American industry for payment.

But the Danger of Inflation is Real

Under these circumstances, there is a growing demand on the part of business groups that price controls be rescinded immediately. It is argued that, once the restrictive influence of price controls is relaxed, capacity production soon will supply sufficient goods to prevent undue price inflation.

It is understandable that business should wish to be rid of Government controls which have operated in such a thoroughly inconsistent and damaging fashion. Unfortunately, there is ground for believing that more harm might result from this cure than from the disease.

There is nothing in our situation that could bring on the kind of inflation that has been experienced by certain countries of Europe and Asia—in which the value of currency deteriorates until it takes a cartload to buy a pair of shoes. But our situation now is definitely more threatening than it was in 1919, after the first World War. At that time wholesale prices and the cost-of-living skyrocketed almost 25 per cent within twelve months. If we discard all controls now, as we did then, prices might easily go up from 25 to 50 per cent in a year's time.

An inflation of that dimension can do tremendous damage. While it lasts, all those dependent upon fixed incomes are damaged—all bondholders, including those who hold war bonds, all life insurance and annuity beneficiaries, all pensioners. Generally, the purchasing power of wages and salaries would shrink, with white collar and unorganized production workers hardest hit. Controlled-rate industries, such as railways and other utilities, would be squeezed. General business would suffer least of all—while the boom lasted.

But such soaring booms cannot last. The 1919 boom burst in mid-1920. By summer of 1921 industrial prices had fallen 40 per cent and industrial production was off 35 per cent; farm prices had fallen 50 per cent. This time the boom might soar higher and last longer, but that would merely result in an even more precipitous drop. Business would be hard hit along with everyone else, and high wage rates would mean nothing to the unemployed.

Controls Must be Consistent and Progressively Relaxed

But if the Nation cannot afford to risk disastrous inflation by immediately abolishing controls, neither can business afford to accept the program which the Administration now proposes.

The wage-price policy will not hold the inflation line so long as the Administration is leading the assault to breach that line on the wage side, as it has done ever since VJ-Day.

The Administration is now going before Congress to ask for a broad extension of its wartime powers for an additional year beyond June, 1946.

Congress must see that this is not granted except upon terms that guarantee the use of such power with a consistency that has been conspicuously absent up to now.

1. It must provide sufficient price relief to yield profits normal to high-level operation.
2. The basis for price relief must be clearly defined and geared to actual costs of operation at the earliest possible date.
3. OPA administrative procedures must be speeded-up and streamlined, or the delays that characterized past administration will become intolerable.
4. It must see that, once established, the new line is held as long as wartime controls are continued by enforcing restrictions on wages as well as prices.
5. It must set an early date for the termination of all wartime controls and provide for progressive and bold steps for de-control to be taken before that date, as soon as production levels in any field are sufficiently high to restrain runaway prices.
6. It must proceed without delay to marshal fiscal and monetary policies to combat inflation, in order that price controls may be discarded at the earliest possible date.

Unless Congress does this—and it will not be easy in an election year—we are headed for an explosion. It will come in one of two forms—either in a continuance of industrial strife, or in a rocketing inflationary boom that can only end in collapse and depression.

President, McGraw-Hill Publishing Co., Inc.

LOAN TO BRITAIN

... *Investment in World Economic Unity*

CONGRESS should give swift and confident approval to the proposed loan to Great Britain.

Few other issues of foreign policy in the present troubled world lend themselves to such clear appraisal of where our National interest lies.

In simplest terms, the question is whether we should extend to Great Britain a credit of $3¾ billions (plus $650 millions in payment for lend-lease balances) in return for her promise to repay principal with interest over a fifty year period starting at the end of 1951, and her pledge to give the fullest possible support to the kind of world trading system which it is the declared policy of both the United States and the United Nations Organization to promote.

We Can Afford to Make It

The sum we hazard is not inconsiderable, but financial risks have meaning only when related to resources. The line of credit provided by the loan will amount, at most, to a claim on 2/5 of 1 per cent of our gross output for the five to six year period over which it may be used. The interest rate charged, while moderate, is higher than our Treasury is paying upon current borrowings. The risk entailed is well within our resources as a creditor. In the considered judgment of the American and British technical experts who thrashed through the intricate accounting for three painful months, the amount and terms offered will suffice to allow Britain, under rigid austerity, to relax her system of foreign trade restrictions, and to expand exports sufficiently to pay her debt commitments.

Against the considered risks of extending the loan, there must be weighed the certain costs of refusing it. Without the loan, Britain has no recourse but to maintain and extend the system of bloc trading which she adopted under stress of world depression and world war. If that is the route Britain follows, she will carry with her a large part of the sterling area countries — all British Commonwealth and Empire countries (except Newfoundland and Canada) plus Egypt, Iraq, and Iceland—and many of the nations with which the United Kingdom has payment agreements (Argentina, Bolivia, Brazil, Chile, Paraguay, Peru, Uruguay, Belgium, Czechoslovakia, Denmark, Finland, France, Netherlands, Norway, Portugal, Spain, Sweden, and Turkey).

Altogether, the United Kingdom's orbit accounts for more than half of the world's imports and exports combined. It likewise is crucial to the trade of the United States. In the years immediately preceding the war, the sterling area and payment-agreement countries provided just under one-half of both the import and export trade of this country.

Russia, of course, will continue to conduct her foreign commerce exclusively upon a state-trading basis. Before the war, the Soviet Union transacted only a little more than 1 per cent of foreign trade business, but its future sphere of influence will be large—conceivably embracing as much as 30 per cent of total international trade.

We Cannot Afford to Refuse It

If the weight of British influence in foreign trade is thrown toward the Russian pattern rather than toward ours, it is apparent that bloc trading, with all of is supporting devices—bilateral deals, exchange controls, import and export quotas, subsidies, currency manipulations and the like —will be the prevailing pattern for foreign transactions.

In self-protection, the United States would have no alternative but to conform to the dominant pattern. We should be forced to form our own bloc, and to enter into active economic warfare in bidding for trade concessions against the offers of our rivals. How well we would do this is problematical. To the game we would bring the largest economic potential in the world. But our handicaps would be equally impressive.

First, under a system in which political and economic motivations are inextricably fused, a democratic nation, and particularly one with a tradition of freedom in its domestic enterprise, would operate at a great disadvantage. We should inevitably be driven toward more and more government control of our entire economy.

Second, with a pattern of foreign trade in which our exports habitually are greater than our imports, our bargaining position in international trade is much weaker than our over-all economic strength would suggest. Under state-controlled trading we should still find it difficult to compete successfully without resort to loans, and under these conditions our loans would be supporting a system alien to our choice and interest.

Third, under a regimented system which made economic decisions subservient to political considerations, it is virtually certain that the volume of world trade would shrink. That was the clear experience of the nineteen-thirties. Thus, the

standard of living in the United States would suffer in common with all others, and we would be forced into a particularly drastic curtailment of certain war-expanded segments of our economy, at the very time when a large portion of the world is most in need of the products they can produce.

Weighing the Alternative Costs

In the years immediately ahead it is certain that from two-thirds to three-quarters of all international trade will be transacted either in pounds or dollars. If both circuits are linked in a determined effort to restore competitive world markets, to which buyers and sellers alike have access without discrimination, that will be the dominant system of foreign trade. If the sterling group with its satellites organizes a closed grid, our exclusive effort cannot preserve the trade pattern that we believe offers most to us and to the world.

No one can accurately measure the costs to the United States of refusing the loan and accepting the consequences. But unquestionably they would dwarf to insignificance the sum risked in the proposed credit. We would lose through the shrinkage of our trade, through the wrench of violent readjustments in our production patterns, and eventually through the curtailment of our over-all output below what it would be under an open rather than a closed system. We would lose heavily in economic liberty under a procedure that can be followed with success only by a close regimentation of production as well as trade.

Most of all, we would lose in prestige, through demonstrating that we are still unprepared to exercise a world leadership to which our giant stature as the possessor of almost half of the world's economic capacity entitles us. Once again we would be exhibiting to the world political feet of clay supporting an economic frame of heroic proportions.

It Is Far from a "Soft" Bargain

There has been some disposition in this country to regard the loan to Britain as a somewhat "soft" and generally unprecedented transaction that smacks of charity. This is the sheerest nonsense.

In the first place, the kind of economic system we want has never functioned and cannot operate now without a lender. For many decades prior to World War I Great Britain filled the creditor role. In 1913 her foreign investments totaled $19 billions, and she not only made such transactions pay, but they proved her salvation through two grim wars. Her credits helped in the industrial development of a large segment of the world, including the United States. Of all the nations in the world, only the United States can assume now the mantle which Britain no longer can support.

In the second place, the terms of our proposed loan to the United Kingdom are far from easy. Britain put a substantially greater proportion of her relatively meager resources into the war than we did, and dissipated a large share of her foreign holdings in the process while accumulating an outside debt of crushing magnitude. On a per capita basis her internal debt is greater than ours. Many Britons feel that our proposed loan is too small, and its terms too rigorous. If the amount proves to be inadequate, we shall have to consider supplemental aid at a later date. But the majority believe that the present offer gives a fighting chance to restore the system of world trade that we and they both want, and upon which the World Bank, the Monetary Fund, and the International Trade Organization under United Nations aegis are based. It is certain that without our loan all of this will go by the board.

In the third place, our proposed loan is far from being without precedent. Canada, which is linked by far closer economic ties to us than to the Empire, already has provided for a loan to Britain of $1,200,000,000. This amounts to almost a third of what we propose to lend, although Canada's population is less than 10 per cent, and her income is little more than 5 per cent of ours.

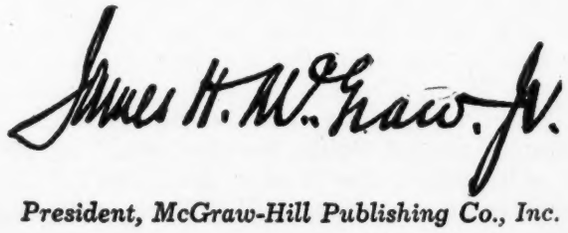
Shall the United States Lead or Follow?

The way to exercise leadership is to lead. Nothing could be more futile than to go half way toward establishing the economic order for which we stand, and then withhold the crucial measure that will make it work. Failure to approve the loan to Britain will be a clear default of leadership. Failure to approve it promptly will dissipate its effectiveness.

It has been officially stated that the British loan is a unique case that will establish no precedents for further credits to other nations. It is exceptional in its importance to our aim. But if the United States expects to make its economic program the dominant one for world trade, it must continue to exercise the creditor function without which that program cannot persist.

The most that we should ask is that future loan transactions be scrutinized as was this one to see that they offer comparable security and comparable return in support of the program for which we stand.

For the loan to Britain, it can be said that never before has one nation had an opportunity to gain so much at so little risk as has the United States in this uniquely decisive case.



President, McGraw-Hill Publishing Co., Inc.

HOUSING CAN COST TOO MUCH

EVERYONE in the United States wants our people, and particularly our war veterans, well housed quickly. Almost everyone, we believe, likes the vigor and imagination with which Wilson W. Wyatt, the housing expediter, is going about the job of mobilizing our housing resources.

No one, however, wants the veterans, or anyone else, to get a lot of severe economic headaches along with the housing. As it stands, the emergency housing program runs unnecessary risks of having such results.

Here are the reasons:

1. The principal opportunity the program offers to the veteran is that of buying a high-cost house where a chance to rent would, more often than not, meet his needs much better.

2. At the worst possible time, the program adds substantially to the dangers of a runaway inflation of the sort that inevitably ends in a crash.

3. Little is done to try to reduce the arbitrarily high costs of building, such as those resulting from restrictions imposed by labor unions and antiquated building codes.

4. By giving overriding priorities to unattainable goals of home construction, the program endangers a volume of industrial construction necessary to sustain full employment.

Needs of Veterans

First on the needs of the veterans. What many, if not most, veterans need is a chance to rent a place at a reasonable rental while they are getting shaken down in their postwar careers which in many cases are inevitably unsettled at this time. Essentially, what the "Veterans Emergency Housing Program" gives them is a chance to buy, for about $6,000, a house built along conventional lines and padded with much unnecessary labor and material cost.

But what are the alternatives? There are at least two. One is to put far more emphasis on more effective use of existing housing than the Wyatt program has thus far. The other is to see that the proportion of new rental units is much stepped up.

Incredible as it may seem, there are at present more than 2,000,000 vacant dwellings in the United States. Many of them should be demolished. But many permit of relatively satisfactory temporary use. Many more single dwellings can readily be converted into comfortable multiple dwellings. The emergency program assumes that only 350,000 dwelling units can be provided this year by these expedients, but it does not seem unreasonable to assume that this figure might be doubled by a vigorous drive. The result would be a better balanced emergency housing program, because it would provide more rental housing immediately and save critical building materials.

Of the new housing units contemplated by the Wyatt program, it is estimated that only about 20 per cent will be for rent. Before the war more than half of the homes in the United States were rented. That means that unless the Wyatt program is to create little less than a revolution in the terms on which homes are occupied, it must be revised to include a much higher proportion of rental units.

To secure the result in the face of present high building costs special inducements will be required. They might be provided by allowing accelerated tax amortization of, say, half the construction cost over the next five years, together with rent ceilings high enough to make this form of investment attractive. This would, of course, call for higher rents, but the actual price to the veteran, in woe as well as money, might well be much less in the long run than if he bought an over-priced house now.

Too Easy To Pay Too Much

One of the mysteries of the Wyatt program is its general emphasis on measures to increase the supply of money with which to buy houses when the demand for houses is already at an all-time high. Some veterans may need special financial help, but the plan to give 90-95 per cent mortgages generally on new homes is not only unnecessary but positively dangerous. By providing up to $3.5 billions of government-guaranteed credit for homes this year, and almost twice as much in 1947, the program will release an equivalent amount of individual savings to create further demand for goods and services. All that such generous mortgage terms will accomplish with certainty is a dangerous lengthening of the odds that we will not avoid a boom and bust cycle of inflation.

If building codes were brought up to date and arbitrary union working restrictions were eliminated, the way would be paved for reductions in the price of standard houses which, it has been estimated, might run as much as 20 per cent. This would both give the buyer of a new house a far better run for his money, and also reduce the inflationary pressure created by the super-generous credit arrangements involved.

Getting anything done along this line is difficult, particularly because the restrictions are imposed by tens of thousands of separate localities and organizations. Some headway is being made. The local emergency housing committees being set up under the Wyatt program provide a means of doing much more. Far more steam must be put behind this aspect of the program, however, if its greatest potentiality for permanently constructive accomplishment is to be realized.

Crippling Essential Industrial Production

The goals set for emergency housing construction —1,200,000 new homes started this year and 1,500,000 started in 1947—are higher than any qualified authority thinks can be met without crippling other essential construction. The reasons commonly assigned for such optimistic goals is that they are inspiring to those in the industry and soothing to those who want something tremendous done about housing.

Under normal circumstances, relatively little damage might be done by such excessive goals which are a common feature of most Washington programs trying to elbow their way to the center of the national stage. However, the emergency housing program carries with it top priorities for the materials to be used. Consequently, other essential construction will have to get along on whatever share of critical building materials will be left after all demands of home builders have been satisfied.

The Civilian Production Administration estimates that output of important materials will fall far short of needs. It forecasts a 15 per cent deficit in lumber, 18 per cent in bricks, and 52 per cent in cast iron radiators. Hence, unless building materials output can be stepped up far more rapidly than now seems possible, a prohibitive squeeze will be put on industrial building to provide the materials needed for the Wyatt program. This would complicate unbearably the problems of sustaining full employment and getting the flow of production so important in avoiding the boom and bust route.

Perspective on the Housing Shortage

What is needed is an aggressive drive to get full production of building materials as rapidly as possible. Such a drive should concentrate on measures aimed at helping the industry remove the obstacles to all-out production rather than on such measures as the subsidy plan which seems quite likely to succeed only in enmeshing the industry in more government controls. After making due allowance for the materials outlook and the needs for essential non-housing construction, housing goals should then be set as high as feasible. As matters stand, by setting construction goals before feasible material goals are determined, the cart is put before the horse.

There can be no doubt about the acuteness of the housing shortage and the necessity of a program commensurate with the magnitude of the problem. It also remains true, however, that the housing shortage for the nation as a whole is not quite as desperate as those who want the country to drop everything and go to building houses would have us believe.

During the war 3½ to 4 million new dwelling units were built or created by remodelling in other than farm areas. The number of families living in such areas increased by less than 3½ million. Even though some of this housing was located in remote places as an adjunct of war production works, the wartime increase permitted a margin for more housing per family at this time. Indeed, it has been estimated that the rate of doubling up is only about one-third as great as in 1940. The margin did not begin to suffice, however, to meet the needs of those millions of people particularly in the lower income groups who, thanks to rapid increases in income, can afford to have and insist upon having better housing than they have ever had before.

A rising standard of income which makes possible a new standard of housing for many people is a fine thing. Above all, it is important to see the veterans get the best possible break in housing.

But Housing Can Cost Too Much

The Wyatt program has many good features. The emphasis on prefabrication, though perhaps over-optimistic, is hopefully modern. The emphasis on local collaboration in solving housing problems which are inevitably in large part local should lead to permanently valuable results. The vigorous mobilizing of 300,000 temporary dwellings to meet at high speed some of the most desperate shortage is all to the good.

The main trouble with the program is that it does not pay enough attention to the economic havoc which may be created in the process of trying to meet its excessive goals. As a nation, we should be and are willing to pay a high price to get adequate housing. But the price will be too high if we:

1. Give the veteran a bad bargain by selling him an over-priced house.
2. Cripple industrial production needed to create good jobs for veterans, and
3. Touch off a disastrous inflationary sequence in the process.

These pitfalls can be avoided. All of us, including the veterans, have a common interest in seeing that they are avoided.

President, McGraw-Hill Publishing Co., Inc.

Congress has acted—and along these lines—since this editorial was written. If the President signs the legislation, we have taken one step forward. If he vetoes it, the voters must resolve a conflict between two branches of their government.

THE LABOR CRISIS
—it's up to Congress

IT HAS remained for John L. Lewis to demonstrate conclusively that, under the sponsorship of the federal government, the power of organized labor has been built up to a point where it can be used to paralyze the economic life of the nation. Therefore, in the elemental interest of self-preservation, the first order of the day is to cut down the power of organized labor to a point where irresponsible leaders no longer have the power to use it to cut down the country.

This will prove an exceedingly complicated job. The federal government, over a dozen years, has developed and buttressed the power of organized labor by many separate steps. They are interlaced in a pattern which cannot easily be unravelled.

Cutting down the power of organized labor to proper proportions will be an operation almost as delicate as brain surgery. To be successful it must impair no basic American political or economic right. It must leave intact the right of workers to organize and bargain collectively through representatives of their own choosing. It must leave intact the right to strike. But it must disassociate from the exercise of these rights opportunities for devastating abuse of the public welfare such as those demonstrated by Mr. Lewis. A meat axe is not the instrument for this operation.

Because of the complexity and delicacy of the operation to be performed it would be helpful if it could be carried out in a tranquil atmosphere. The urgency of the problem is such, however, that no time can be lost in getting at it.

Guiding Principles

However, the dangers that haste or heat will lead to serious blunders can be largely eliminated if the process of bringing the power of organized labor back within safe and reasonable bounds is governed by principles to which all fair minded people can fully subscribe.

The most important of these principles is that it is an abuse of public authority to extend special privileges to organized labor.

When in 1935 Congress passed the Wagner Labor Relations Act, one of the great buttresses of the power of organized labor, it was upon the explicit theory that organized labor was weak and needed coddling by the federal government if it were to survive, let alone grow big and strong. In the policy section of that act it was stated that "the inequality of bargaining power between employees who do not possess full freedom of association or actual liberty of contract, and employers who are organized in the corporate or other forms of ownership association substantially burdens and affects the flow of commerce . . . "

Regardless of whether or not that was a correct reflection of the situation in 1935, it bears no relation to the situation today. Under the continuous sponsorship of the federal government, the power and bulk of organized labor has waxed until today it is preposterous to regard it as the weak sister in its bargaining with employers. If, after being continuously demonstrated since V-J Day, the proposition that the pendulum of organized power has swung too far over on the side of organized labor needed any final and clinching demonstration, John L. Lewis provided it.

Changes in the Law

Translation of the principle that organized labor is no longer a weakling, requiring a diet of special privileges, into specific legislative enactments is a detailed technical operation beyond the scope of this statement. It is possible, however, to indicate some of the general lines it should follow. Here they are:

1. The duty to bargain collectively, now imposed upon employers by the Wagner Act, should also be imposed upon the leaders of organized labor who are now under no legal compulsion to bargain.

For well over a month Mr. Lewis made a complete mockery of the process of collective bargaining by refusing even to state his demands until the coal operators had approved "in principle" a plan for a miners' "health and welfare" fund which he fancied. In the meantime the country was plunged into an ever deepening crisis.

2. Unions, as well as employers, should be made liable to suit for damages for breaking their collective bargaining agreements.

A degree of responsibility commensurate with their age and power requires that unions be liable, to the extent of union funds but not the funds of individual members, for carrying out their agreements. To have it otherwise is to hold that a collective bargaining agreement is, by defi-

nition, a phoney agreement so far as the union is concerned. Outlaw strikes are the fruit of this lop-sided arrangement.

3. Employers should be given more discretion, in reinstating employees who have gone on strike than is now permitted by the Wagner Act.

The Wagner Act largely eliminates the risks involved in striking because of the requirements it imposes upon employers to take workers back when they have decided to return to work. These requirements make it virtually impossible for the employer to replace workers even if they are engaged in the most unjustifiable of strikes. At the least workers who have smashed up property and stirred up violence in the course of a strike should have no rights under the Wagner Act. How much further the Wagner Act straitjacket should be loosened at this point should be carefully explored, and excesses encouraged by the Act should be removed.

4. The wedge which the National Labor Relations Board has driven into the orderly conduct of American industry by holding that foremen are covered by the Wagner Act should be eliminated.

The issue involved here is continuously mislabelled and confused as that of the right of foremen to organize. There is no question of the right of foremen to organize any kind of a legal organization they desire. That is their right as American citizens. The issue is whether or not the special privileges accorded by the Wagner Act, which in some circumstances has been so construed as even to prevent employers from talking with their workers, should be extended to foremen who, if American industry is to have a chance to do its duty effectively, must represent management with full loyalty and responsibility.

A member of John L. Lewis' United Mine Workers takes an oath which provides, in part, "that I will not reveal to any employer or boss the name of anyone a member of our union" and will "defend on all occasions and to the extent of my ability the members of our organization." Mr. Lewis insists that the coal operators contract to deal with foremen to be organized in a union where they will take that oath, and where their activities will be separated from the influence of employers by the barriers imposed by the Wagner Act. Such an arrangement undercuts orderly management of American industry.

5. The exemption of labor unions from the federal anti-trust laws, provided when organized labor was presumed to be weak, should be modified to take account of its vastly increased strength, and the use of this strength to destroy business enterprise and create monopoly.

As matters stand unions can run employers completely out of business by secondary boycotts and run fellow workers out of jobs in the process. An Ohio manufacturer, working with a government-certified C. I. O. union, is put out of business because A. F. of L. workers refuse to handle his products. Still the government, this time in the person of the United States Supreme Court, says that actions of this sort are above the law because Congress exempted unions from the federal anti-trust laws.

To eliminate one of the most devastating forms of restraint of trade, this exemption should be cut down forthwith by subjecting unions imposing secondary boycotts to the same penalties under the federal anti-trust laws as those to which employers doing the same thing are subjected. And the question of further narrowing the obsolete exemption of unions from the federal anti-trust laws should be fully explored.

6. The levying of special sales taxes for the exclusive benefit of unions should be prohibited by law.

As a matter of good government the right to levy consumption taxes should be reserved to the public authorities and used strictly for public purposes. As a matter of good economics, payments to workers or their organizations should be included in the payroll where they can be properly counted as part of the cost of production.

Equality Before the Law

When everything that can conceivably be accomplished by legislation has been accomplished there is no reason to believe that an ideal or even a surely workable system of industrial relations will have been devised. Many of the mainsprings of such a system lie deep in the hearts of men and far beyond the reach of legislation. There is no chance, however, of having such a system, or even a defensible system of democratic government until special privileges which tip the scales of power far on the side of organized labor are withdrawn and there is some measure of equality for employers and organized labor before the law. Though it is hard to believe it at the moment the country may come to be grateful to John L. Lewis for driving that lesson home so ruthlessly.

President, McGraw-Hill Publishing Company, Inc.

OPA IS DYING—
...*what next?*

IT IS NOW clear that direct price control of the OPA type is on the way out, if not by legislative limitation then by administrative collapse.

It is equally clear that we are by no means past the danger of a swirling upsurge of prices.

Then does it follow that the passing of OPA need be tantamount to a decision to let 'em rip?

It does not.

While the OPA machinery is grinding to a stop, we can bring into play more fundamental measures to keep prices within safe limits—and to allow private management a wider area of freedom. What this article proposes is a framework of control within which private business judgment can operate. Therefore, this preamble speaks directly to our friends in the business community.

Now is a time for unrelenting self-restraint by business management. As price control disintegrates, business must scrupulously hold to prices which, after covering costs, yield *normal* profit margins. Business has everything to lose and nothing to gain if its price policies emulate the excessive wage demands made by some unions.

True leaders of business sense the danger. They do not want to price themselves out of their markets. They do not want the tag of price hogs. They do not want a buyers' strike. All management must practice the self-restraint which characterizes the wisest leaders among us.

What Wasn't Done

Virtually all responsible economic analysts agree that if direct price control is eliminated and nothing else is done, prices will move upward. The only serious disagreements are: How far? And for how long?

Some careful and competent forecasters believe that, if all price control is lifted, the official cost of living index will shoot up at least 25 per cent within a year. Some of them think that wage rates will chase right after prices, forcing new price increases until the whole operation ends in a dizzy crash.

Others agree that prices will go up all right, but they think that increased production, made possible by disentanglement from OPA red tape, will bring them down again fairly soon.

Recent developments seem to support those forecasters who think that wage increases would chase right after price increases and thus keep "the inflationary spiral" spinning toward a ghastly fall. Unions already agitate for a new round of wage increases to offset price increases which have occurred in the few months since the last round of wage increases.

Therefore, the prudent course would have been to clean up the OPA price control system, to keep it in place for a limited period as a stop-gap, and, meanwhile, to arrange to replace it with more fundamental controls, PROVIDED the federal government itself stopped promoting excessive wage increases. *The greatest single contribution to the wrecking of the OPA has been the holes driven in price ceilings by government-promoted wage increases.*

But now the stop-gap is being eliminated, and the fundamental controls are not in place. Their erection becomes urgent.

The Basic Task Now

The danger that prices and wages will get to chasing each other around a ruinous spiral arises, of course, from the accumulation during the war of an enormous sum of money that could not be spent because about 40 per cent of the nation's production was being devoted to war. Men were paid wages and profits for making artillery shells. The shells were exploded. The money remains. It has piled up until the people's backlog of cash spending power, in one form or another, exceeds $225 billions—three times the total in 1939.

More than that, banks hold $115 billions of government securities—a sixfold increase since 1939. These securities can serve as the basis for an expansion of bank credit of many times their volume. A dollar of bank credit will, of course, buy as much as a dollar of cash.

The first and basic task of preventing runaway prices is: *Get this huge accumulation of purchasing power, actual and potential, under some kind of effective control.*

A second task is to see that no unnecessary additions are made to the flood of purchasing power overhanging the market. A third task is to get the productive machinery of the country running at top speed so that it can take up the accumulation in an orderly way, not in a boom-bust sequence. We shall talk here only about the first two of these tasks.

Are there ways of getting at the root cause of a disastrous wage-price spiral which are being neglected? There are many of them. Attention has been distracted from them by building up the battle over OPA as the Armageddon of price stabilization. It is important. But it is not Armageddon. If everything that Mr. Bowles and his associates want done by way of price control legislation were done, the problem of price stabilization would still remain unsolved in the continued absence of a program to deal effectively with root causes.

Basic Remedies

Here is a rough outline of the key elements of a basic program.

1. Cut public expenditures to the bone and let tax revenues accumulate as business volume increases—perhaps broadening the tax base at the same time.

Now, if ever, is the time to run a surplus and to use it to retire debt. Immediate upward pressure on prices would thus be removed and the burden of carrying debt when the going gets tougher later on would be relieved. A $10 billion surplus of federal, state and local revenues during the next year might not be too much.

An increase in social security taxes, as the House Ways and Means Committee proposes, offers one of a number of good ways to increase revenues. Deferring public works not immediately needed affords one of numerous ways by which substantial cuts in expenditures can be made.

2. Tighten the terms on which installment credit is available for the purchase of houses, automobiles, and other consumers' goods.

Allowed to run a free course, expansion of credit to buy houses and durable consumers' goods might easily add $15 billion to consumer purchasing power next year. No such injection of credit is needed now. The more a man buys "on time" the more cash he keeps to spend on something else. For most products the cash market alone is more than big enough to keep producers busy and customers healthy.

3. Restore to the Federal Reserve system its lost control over the supply of credit by limiting the opportunities for credit expansion now afforded by huge bank holdings of government securities.

The specific measures needed are highly technical, but are agreed upon by banking experts as both feasible and fair. The important thing for the public at large to do is to recognize that we are, in effect, sitting on a powder keg with lighted match in hand until the measures are taken.

4. Revive a vigorous campaign to sell government savings bonds and other government securities to the public.

Sale of government savings bonds cuts down current consumer spending. It also allows the Treasury, if government spending is held down, to retire government bonds which the banks hold. Thus, it simplifies the problem of keeping bank credit within safe bounds.

5. Prevent a speculative inventory boom of the sort which preceded the post-World War I business collapse in 1920-21.

This involves a continuation of the loose controls of inventories now exercised by the government. In more important degree it involves well informed cooperation by bankers and business men to keep inventories from being expanded unnecessarily.

6. Maintain controls on exports in order to keep within reasonable limits the impact on our market of huge foreign demand.

Emergency foreign relief requirements must be met. But foreign demand which is enormous apart from relief requirements must be kept under control until the danger of having it send prices of export products soaring is past.

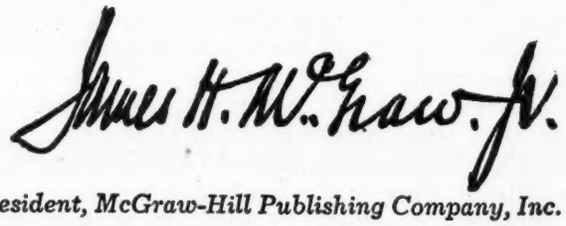
Breathing Space for Business

This program would deal with causes, not symptoms. Hence, if promptly and efficiently installed, it would do a far better job of keeping the general level of prices and wages within tolerable limits than the OPA type of price control ever could have done—even if OPA had not been so often and so badly mismanaged. The program would also do this without tying up American business in a myriad of irritating and discouraging individual regulations. It would establish broad bounds within which business enterprise would be free to be itself, not a branch of bureaucratic enterprise.

The program proposed here also has the major virtue of flexibility. If prices start to reverse their present upward course within another year, the major parts of the program can be adjusted or removed quickly.

It would be gratifying to suggest junking at once all arrangements designed to place limits on price movements, even broad limits of the sort here suggested. But to do nothing while OPA falls apart, would be to run the grave risk of a runaway of prices and wages which, in the inevitable collapse, would do irretrievable damage to the business community and to the whole nation.

The risk is not worth taking.



President, McGraw-Hill Publishing Company, Inc.

LABOR DAY • 1946

—Time for wise union leadership

LABOR DAY, 1946, finds one hopeful element in the relations between American management and labor which was not there on Labor Day, 1945. It comes in recent expressions by a number of national leaders of organized labor that increased "real" wages depend upon *increased productivity,* i.e. increased output per man-hour. Increased money wages which are promptly offset by higher prices do nobody any good.

If these expressions, *which still remain to be substantiated by practical performance,* come to be accepted by the rank and file of labor in each community, Labor Day, 1946, can usher in a period of great and perhaps unprecedented improvement in the economic wellbeing of wage earners—as well as the wellbeing of the country at large. If, on the contrary, they remain merely window dressing and there is a continuation of the post V-J Day process of increasing wages and then prices, the outcome can only be the bursting of an inflationary bubble, with attendant suffering for workers and the community generally.

Competition requires management to bear down heavily on increased labor productivity as a prelude to wage increases. Management, however, has rarely made a more forthright statement on the importance of increasing labor productivity than that contained in a recent issue of LABOR'S MONTHLY SURVEY, an official publication of the American Federation of Labor.

William Green, the Federation president, led off with a "message to American workers." He remarked, "Our major need is increased volume of production." Observing that "wage increases this spring have been paid for by raising prices," the survey itself goes on to say that "Today America's ability to raise wages without increasing prices and living costs depends on increasing productivity in civilian industries . . . Here is the challenge to free labor and free enterprise today: *Cooperate to increase productivity and raise living standards without strikes.*" (Italics supplied.)

The importance of increasing production was also recently stressed by Walter Reuther, President of the United Automobile Workers, C.I.O., who remarked that his union "is just as eager as management to get the (automobile) industry into maximum production." In taking this general line he was in accord with the position of Philip Murray, head of the C.I.O., who in a book, "Organized Labor and Production" written with Morris L. Cooke, remarks that, "The modern labor leader also realizes that to receive a good day's pay a man must do a good day's work and that *increased productivity has been the vital factor in the country's industrial supremacy and its relatively high wage scale.*" (Italics supplied.)

In citing increased productivity as the key to increased "real" wages these labor leaders—and management—have the historical record entirely on

SPOT CHECK ON LABOR OUTPUT

In the absence of reliable general statistics on what has happened to productivity of labor since V-J Day (because of strikes and reconversion complications) the McGraw-Hill Publishing Company asked the executives of a cross section of American industry to report their own impressions. The questions asked and summaries of the replies, which varied markedly from industry to industry and plant to plant, follow.

Question No. 1. How well have workers performed since V-J Day as compared to their pre-war effort?

Answer. Worker effort has been below pre-war. There are exceptions, particularly among older and more experienced workers; and there are quite a few signs of improvement.

Question No. 2. How much headway have you been able to make since V-J Day in improving labor productivity by better equipment and organization?

Answer. Some headway is generally being made, but it has been greatly retarded by inability to get new equipment and, in some cases, by lack of labor cooperation in improvements in organization.

Question No. 3. How much improvement in equipment and organization is to be anticipated in your business over the next year?

Answer. Marked improvement in productivity (in a few cases as much as 20 per cent) can generally be made if there is sustained production and full cooperation between labor and management.

their side. In the 40 years prior to the outbreak of World War II output per man-hour for the country as a whole was approximately doubled. Over the same period the "real" hourly earnings of industrial workers were also approximately doubled. There were, of course, great variations in the increase of output per man-hour from one line of activity to another. Also, there were periods when increases in "real" wage rates lagged behind increases in productivity. But for the 40 year period as a whole and the economy as a whole there is no mistaking the fact that the route to increased "real" wage rates was increased productivity.

Three economic factors played major roles in this doubling of production per man-hour which has made America the industrial marvel of the modern world. One was the skill and diligence of American workers. A second was the skill and diligence of American management in organizing production. A third was the improvement of machinery and the increased application of power to it.

Wartime Record

During World War II this sustained increase in the productivity of labor in *civilian* manufacturing industries, which had averaged about 3 per cent a year, was brought to an abrupt halt. Much of the most efficient segment of the nation's labor force went to war or war industry. Also, civilian industry was starved for new equipment while we equipped our arsenals. The result was that the productivity of labor in those civilian manufacturing industries for which the government keeps records actually declined throughout most of the war. By 1945 it was no higher than in 1941, whereas, if it had maintained the long run average, it would have been about 12 per cent higher. In the meantime, however, average hourly wages in these civilian industries had increased about 40 per cent.

In *war* industry, which started from low levels of production at strange tasks, there were substantial increases in output per man-hour. Many of these increases involved new processes, improved techniques, and better machines which can be adapted over a period of time to the improvement of productivity of labor in civilian industry.

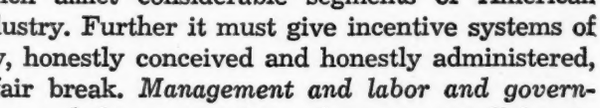
Since V-J Day, however, labor, led on by a misguided government, has had its sights on higher money wages instead of improving productivity which would have laid the foundation for increased "real" wages. Consequently, debilitating industrial strife ended in a round of wage increases which, in the absence of increased productivity, is being washed out by higher prices.

To Keep Production Rolling

However, as indicated by the summary of a McGraw-Hill sampling of the current experience of industry in increasing output per man-hour, which appears in the center of the page, there is hope that the situation ahead can be improved. After agonizing delays because of work stoppages, material shortages, and reconversion complications, industrial production is beginning to roll again. Allowed to roll it will not be long before it will be making those advances in productivity which are the only true basis for increased "real" wages.

If the process of keeping American industry rolling to new highs of productivity is to be resumed, management must see that the past practice of translating increased output per man-hour into increased "real" wages is not only sustained but wherever possible accelerated. For its part organized labor must abandon its manifold feather bedding rules and other production-restricting practices which afflict considerable segments of American industry. Further it must give incentive systems of pay, honestly conceived and honestly administered, a fair break. *Management and labor and government and the community at large must collaborate in removing that specter of working one's self out of a job which has been one of the greatest causes of restriction of output.*

The current emphasis by leaders of organized labor on the economic truth that increased output per man-hour is the only road to increased "real" wages is important. The next step is to see that recognition of this truth seeps into the rank and file of labor and industry and becomes the basis of a program of action at the local level. If it does, and quickly, Labor Day, 1946, may mark a tremendous turning point toward sustained prosperity not only for labor but the community at large. If it does not, union leadership will fail in its responsibility and must answer to the American people for the consequences of such a failure.



President McGraw-Hill Publishing Company, Inc.

A FREE ECONOMY IS WORTH FIGHTING FOR

BUSINESS must take the initiative if the price decontrol machinery, set up by Congress, is to be effective. The present price control law is far more than a set of instructions to the administrators of OPA; it is a challenge to business to be aggressive in speeding decontrol decisions and in persuading the Price Decontrol Board to adopt a strong stand for return to a free economy.

Thus far business has not met this challenge. *Two months after the passage of the new price law not a single application for decontrol of a major product had been filed by an industry advisory committee.* This is due in part to the red tape controlling such applications. Nonetheless, a continuation of such inactivity on the part of business can well result in perpetuating price control far beyond the time either the present law or sensible economic policy require.

It was the clear intent of Congress to hasten our return to a free economy. In the legislation continuing the general control of prices, Congress formally declared its purpose to have it "terminated as rapidly as possible."

To accomplish this, the House originally approved a formula which would have made decontrol mandatory when production had attained a prescribed level. The automatic decontrol provision was dropped before the bill was finally passed, partly because of the uncertain effects of strikes on production. But Congress did not mean to return the timing and extent of decontrol to the administrative discretion of OPA.

On the contrary, to assure having price control "terminated as rapidly as possible," Congress created a Price Decontrol Board and gave it power to overrule OPA when the board finds price control should be removed. Moreover, it gave to industry the right and the responsibility to seek decontrol. Also, in a further effort to speed up the decontrol process, it placed narrow limits on the time allowed for board decisions.

Congress had compelling economic reasons for doing its legislative best to speed up decontrol.

1. It is by all odds the best way to eliminate the bottlenecks in production and the black markets which have plagued the country since V-J Day.

Rigid price ceilings promote shortages of badly needed commodities by discouraging their production. Such shortages both upset the flow of production and promote black markets. At present a considerable part of American industry is stymied by shortage of critical parts and materials. Price control is much to blame.

2. There must be flexibility of prices if a round of new wage adjustments, which may be forced on industry early in 1947, is to be negotiated without grave risks of seriously curtailing production.

When, under the leadership of the national administration, the first post V-J Day round of wage adjustments was made, price ceilings were held rigid while wages were boosted. The result was a series of price-wage squeezes which upset production. They would have been disastrous if we had not been in a sellers' market, created by a tremendous accumulation of wartime shortages. In 1947, however, many industries will be in a buyers' market. It must be possible, therefore, to have wage increases reflected promptly in price adjustments if we are to avoid a repetition of the costly post V-J Day round of strikes, which often had price control as the key issue.

3. Rapid decontrol is necessary to maintain a high level of employment and production.

Almost five years of price control inevitably twisted the factors of production and distribution far out of the equilibrium which would prevail in a free economy to which it is the clear purpose of the nation to return. Unless the return to a free economy is facilitated by a speedy and orderly decontrol, the jolt of an abrupt return to competition can be expected to upset employment and production seriously.

It's Up To Business

To encourage speed and boldness in decontrol, Congress provided for the reimposition of control over any prices which, after being released, might

get out of hand. The dangers of this sort are chronically exaggerated. During the 25-day period in July when there was no price control the Civilian Production Administration found that "manufacturers of finished industrial and consumer products have generally exhibited commendable restraint in increasing prices no more than increased costs."

All of this endeavor to speed up decontrol and expand its scope is likely to be futile, however, unless business furnishes the driving power for the machinery Congress provided. OPA certainly will not do it. Neither can the Decontrol Board be expected to go out and drum up cases.

The necessity for vigorous action by business in pressing for decontrol is increased by the fact that the general legislative standards to guide decisions by the Decontrol Board are vague. They must be clarified and sharpened by decisions in specific cases.

The main principle to guide the decontrol of non-agricultural products is that price ceilings shall be removed when supply is in approximate balance with demand. But what precisely does that mean? The meaning will become clear only through Decontrol Board decisions.

The same is true of the principle which makes automatic decontrol of a non-agricultural commodity contingent on whether or not it "is important to business costs or living costs." Business must press cases which will give specific meaning to those vague terms if decontrol is to get on apace.

Cards Are Stacked

At present the government has the cards pretty well stacked against rapid decontrol.

First, the key members of the staff of the Price Decontrol Board are holdovers from the Bowles regime which emphasized the importance of carrying on price control rather than speed in getting rid of it.

Second, in exercising his authority to prescribe regulations to govern petitions for decontrol, the OPA administrator has required excessively complicated statistical and economic data. Manufacturers who are sure they can convince any fair-minded board of the desirability of decontrolling certain of their products assert that they are blocked by statistical entanglements.

Third, OPA has discouraged business from moving immediately under one section of the law to speed decontrol. This section provides that products "not important in relation to business or living costs" may be freed from price ceilings immediately and must be freed by December 31, 1946, unles OPA specifically finds they are important to these costs. Instead of making it possible for business to move under this section now, OPA has issued rules which have the effect of blocking such a course until the end of the year.

In the light of obstacles such as these, it is not surprising that the record of decontrol to date is not impressive.

Decontrol Record

Since June 30 there has been a drop from about 70% to about 60% in the total value of products under price control. But most of the drop has been accounted for by food products, which Congress took the lead in decontrolling, and by industrial machinery which was being decontrolled when Congress acted. By far the larger part of manufactured consumer goods remains under control.

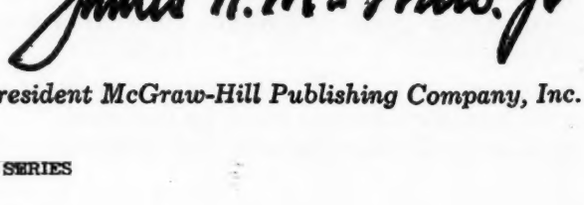
This, however, is no time for business to be discouraged. Rather, business should accept the obstacles put in its way as a challenge and work harder than ever for speedy decontrol.

The case for decontrol should not be stated in narrow technical terms. It should be based on grounds of broad public policy, and should demonstrate how a speedy return to a free economy can hasten the full release of the nation's productive power.

For example, there should be very clear demonstrations of how, in far too many cases, rigid price ceilings—(1) discourage production of key parts and materials by making such production relatively unprofitable, (2) create shortages of key parts and materials which tie up broad ranges of production or result in piling up lopsided inventories of partially completed goods, and (3) thus cut away the foundations of a stable economy and the prospects of steadily sustained employment.

There should be equally full demonstrations of the well known sequence from shortages to unrealistic price ceilings to black markets. Meat prices are rolled back, but the meat is rolled under the counter.

A free economy is worth fighting for. Liberty is preserved only by the constant struggle of those who believe in it. Neither the interests of the nation in a strong and well-balanced economy nor the interests of business itself will be served by drifting at this time. Now is the time for business to lead a strong offensive for speedy elimination of price control.



President McGraw-Hill Publishing Company, Inc.

THIS IS THE 51st OF A SERIES

DEPRESSION IN '47?
...controls can bring one

IT IS CONVENTIONAL for the American business man, who values freedom, to protest against government regulation. On this account, many people who do not know the facts in detail are inclined to discount current business protests against the post-war application of wartime economic controls. This is particularly true since in his report for the third quarter of this year, the Director of War Mobilization and Reconversion implied that business is in fine health by remarking that "business profits, after taxes, are at the highest point in history."

In complaining about government controls, however, the American business man is not crying wolf. These controls were an essential war weapon. Now, however, they are contributing decidedly to a twisting and distorting of the American economy in a degree which, if not soon corrected, may well start production and employment down the toboggan.

One general indication of how badly twisted our economic system has become is found in the wide disparities in the amounts by which different groups of prices have increased. Since 1941, for example, farm prices have advanced an average of about 125%. Industrial prices, more tightly controlled than any other group except rents, have increased only about 32%. Meanwhile, straight time hourly earnings of industrial workers have gone up about 60% and the cost of living about 43%.

The advances of individual prices within these groups have also varied enormously. Among industrial prices, that of finished steel has gone up only about 14% since 1941, while lumber has gone up over 50%. Hourly wage rates in the women's garment industry have gone up 116%, while those in the brewing industry have gone up only 33%. That share of the cost of living due to rent has gone up only 4%, while that due to the cost of clothing has gone up over 60%.

Well, What Of It?

At least four things of major importance:

1. Production, under the influence of price control, has been heavily concentrated in some lines to the neglect of others. Result—unbalanced production, unbalanced inventories, and a serious cut in the flow of goods to consumers.

2. More or less uniform post V-J Day wage increases, promoted by the federal government, have imposed a far more serious cost problem on some industries than on others. This is particularly true of some of the most basic industries.

3. While, as a whole, "business profits, after taxes, are at the highest point in history" (due in part to a temporary excess profit tax rebate arrangement) there are enormous disparities in the profits of different industries. Some key industries are making little or no profits.

4. **If not corrected, the distortion of prices, wages and production, which has resulted in such a wide disparity of profits, can contribute decisively to a major business upset.**

The most striking example of the distortion of production by controls was, of course, that provided by a metropolitan meat famine at a time when beef cattle crowded the ranges. This has now been recognized. But there are many other distortions. Abundance of sports clothes, acute shortage of more essential clothing made from the same kind of cloth. Successive shortages of critically important products like baling wire and nails as the price lid on steel is jiggled first this direction and then that.

Some of these distortions of production are due to material shortages. But a major contributor is uneven application of controls, and the total removal of some while others are held firm. Among the results are bulging inventories of partially completed assemblies and shut-downs while waiting for parts.

Wage Complications

While price controls, unevenly applied, have shunted production first this way and then that, the federal government has further complicated the situation by promoting uniform wage rate increases without regard to varying capacities to pay them. The greatest single contribution to this distortion was made by the President himself. In the course of

unsuccessfully trying to mediate the dispute over steel wages last January he recommended a wage rate increase of 18½ cents an hour. Immediately that increase was accepted by organized labor as par for the first round of wage adjustments, having the sanction of the White House itself. The game then became to beat par.

But the capacity of different industries to pay wage increases varied greatly. During the war some had hiked their pay much more than others. Moreover, in some industries wages are a much larger element of total cost than in others. In 1939 (last year for which figures are available) wages ranged all the way from 2½% of total sales in cigarette manufacturing to 34.3% in hosiery manufacturing and 65.2% (for wages and salaries combined) in soft coal mining.

Under these circumstances, some industries were far less able to meet a uniform wage increase than others. Nonetheless, many of them had uniform wage increases imposed upon them. Then the price lid was held firm. This, coupled with material shortages and production difficulties which also choked output, squeezed the profit right out of those industries.

A Study In Contrasts

Some of the most important industries are making little or no profits while they bump along on a production volume which fails to meet consumer needs and prevents attainment of maximum efficiency. The automobile industry affords one conspicuous example. Another is electrical manufacturing, and rail equipment is yet a third. All of them are crucially important. Many other lines of business, of course, are extremely profitable. For example, the profits of a group of large retail stores were 150% higher during the first half of this year than they were a year ago; the profits of a group of motion picture companies were up 140%.

In the meantime, the workers in some of those low-profit industries are in no bed of roses. The increase in the cost of living since 1941 is now outstripping the increase in the hourly wage rate of workers in a number of industries, where wage rates have not risen as much as the average. On a weekly basis, a shorter work week, with less overtime, has combined with the recent upsurge in consumer prices, to place the living standards of some of these workers below the wartime level.

Such circumstances obviously create pressure in the ranks of these workers for another round of wage increases. But as long as the profit remains squeezed out of their industries wage increases, if any, must be translated either into higher prices, or, if the government sits tight on the price lid, into losses which will discourage production and ultimately cost workers their jobs.

What To Do?

Salvation both for the workers and for employers in the relatively profitless section, a peculiarly important group of industries, must be looked for primarily by increasing productivity, thereby decreasing the cost per unit. Part of this higher productivity can come only from individual efforts of the workers themselves. Another part can come from an elimination of bottlenecks in materials and parts which prevent the labor force from working most efficiently. Only by greater output per man-hour can workers and management solve their common problem.

Until productivity has been thus increased, it is hard to think how the federal government could do a greater disservice both to labor and to industry than to repeat its performance of promoting a uniform national wage increase. With the present distortion of the national economy, some industries might again take such an advance in their stride. With many others it would raise even greater havoc.

While avoiding like the plague promotion of another uniform wage adjustment, the federal government must make it a primary objective to relieve distortions caused by the uneven application of other controls, primarily price control. Nature has given a lift to the elimination of distortions by providing bumper grain crops which should in time reduce that staggering disparity between a 125% increase in farm prices and a 32% increase in industrial prices. But that process must be speeded as a matter of conscious policy. No element of such a policy is more important than expediting the decontrol of industrial prices. Such a course is clearly essential to achieve that balance in the production of materials and parts required for maximum output.

Business and labor both want a sustained prosperity in which all will share. Sustained prosperity can be achieved only if we eliminate the distortions in wages, prices and profits which now restrain so much vital production.

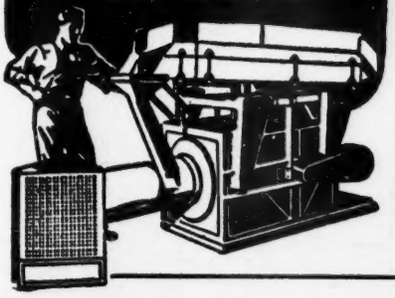
President McGraw-Hill Publishing Company, Inc.

No More STONES in Your Bottle-Neck!

Removing stones has always been slow, laborious and costly, out of proportion to other steps in processing cereals, soy beans, and other dry foods. To eliminate this great headache of the cereal and other dry food processors, we have developed a new type stoner—revolutionary in design, amazing in efficiency, low in first cost, in operation. Removes stones, glass, non-magnetic as well as magnetic metals, and all other hard, dangerous contaminations from cereals, soybeans, and other beans, and other food products with, 1) an action so sensitive the tiniest particles are easily removed; and 2) operating cost so low it is relatively insignificant; and 3) 99.9% efficiency. Capacity up to 16 tons per hour.

Write for Bulletin FI-446

SS&S AIR-FLOAT STONER



SUTTON, STEELE & STEELE, INC.
DALLAS, TEXAS
In Canada—Kip Kelly, Ltd., 68 Higgins Ave., Winnipeg
Foreign—Separations Engineering, Ltd., 133 Bush House, Aldwych, London

Schwarz Technologist testing reconstituted cooked, dried eggs on the basis of color, odor, flavor and physical condition.

The Objective Viewpoint

An Important Characteristic of Schwarz Laboratory Service

Food and beverage plant executives often prefer to augment their own research and laboratory facilities by applying a fresh, impartial viewpoint to problems arising in their processing or plant operations.

In many instances Schwarz Laboratories, Inc. has been called in to provide this objective outlook. Here are two essential reasons:

Schwarz equipment . . . Our *complete* laboratory facilities enable us to investigate foods and beverages at the maximum speed and economy consistent with the highest standards of accuracy.

Schwarz experience . . . The authoritative knowledge gained in more than 75 years of analyzing a host of food products enables us to analyze and solve your problems more efficiently.

Therefore, Schwarz Laboratories, Inc. are *equipped* and *experienced* to test and analyze your food or beverage at every stage of development—from the selection of raw materials, through processing, to the protection of the finished product through extended shelf life.

Schwarz LABORATORIES INC.

Consultation with a Schwarz representative—about any of our services—will involve no obligation on your part.

SCHWARZ LABORATORIES, INC.
202 East 44th St., New York 17, N. Y.

big news
GOVERNMENT
OWNED
SURPLUS PLANTS

FOR LITTLE BUSINESS!

You know that your Government is offering a wide range of choice plants for sale or lease—on attractive terms.

What you may not know, is the exceptionally favorable position of so-called "small business" in acquiring these properties for its particular needs.

If you are *not* the dominant firm in your field—or are *not* affiliated with the leader—or do *not* employ *more* than 500 persons . . . you may be able to qualify as a "small business" under the law governing disposal of these facilities.

Once you are so qualified, there is immediate possibility for you to obtain the plant you want under *high priority*—a priority given the Reconstruction Finance Corporation to purchase these plants for re-sale to small business. Our field offices will advise you how to obtain this priority certification.

You will find that the Government's surplus plant offerings are highly flexible, for example: (1) Entire plants (both large and small)—(2) Land and buildings only—(3) Land and buildings together with such portions of the contained equipment as may be desired—(4) Specific, separate buildings, where the facility is economically and operationally divisible; and—(5) Lease of a portion of a single building under a multiple-tenancy arrangement.

If you are thinking of *expanding* your production, *modernizing* your facilities, *adding* a new process, *relocating* your business or starting a *new* enterprise—make your needs for plant and equipment known to the War Assets Administration office nearest you—see list below.

Write, phone or call for the PLANT-FINDER, a fully indexed, descriptive catalog of Government-owned plants.

WAR ASSETS ADMINISTRATION

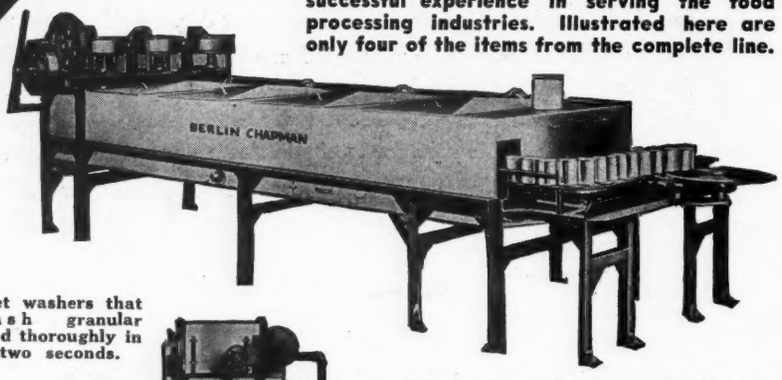
OFFICE OF REAL PROPERTY DISPOSAL

Offices located at: ATLANTA • BIRMINGHAM • BOSTON • CHARLOTTE • CHICAGO • CINCINNATI CLEVELAND • DALLAS • DENVER • DETROIT • FORT DOUGLAS, UTAH • HELENA • HOUSTON JACKSONVILLE • KANSAS CITY, MO. • LITTLE ROCK • LOS ANGELES • LOUISVILLE • MINNEAPOLIS NASHVILLE • NEW ORLEANS • NEW YORK • OMAHA • PHILADELPHIA • PORTLAND, ORE. • RICHMOND ST. LOUIS • SAN ANTONIO • SAN FRANCISCO • SEATTLE • SPOKANE • TULSA

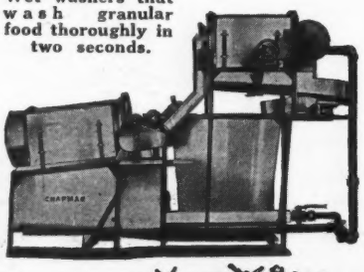
181-3

A COMPLETE LINE OF PRODUCTION FOOD PROCESSING MACHINERY

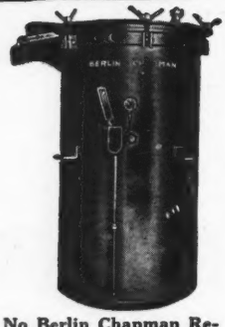
Let us tell you now how Berlin Chapman high speed equipment can help you attain both increased production and at the same time turn out the highest quality products. Berlin Chapman equipment is a line built for performance—and backed by over 35 years' successful experience in serving the food processing industries. Illustrated here are only four of the items from the complete line.



Exhaust boxes that exhaust every can in the same period of time, and with unlimited capacity.



Wet washers that wash granular food thoroughly in two seconds.



No Berlin Chapman Retort has ever been replaced by any other make.

Juice extractors that save the natural color and all important vitamins in your juices.

Write for complete information on any equipment you may need.

BERLIN CHAPMAN CO. **BERLIN, WISCONSIN**

HIGH SPEED JUICE EQUIPMENT
- Juice extractors
- Juice tanks
- Coils
- Exhaust boxes

PEA PROCESSING EQUIPMENT
- Washers
- Blanchers
- Picking tables
- Separators
- Graders
- Regraders
- Elevators
- And all equipment necessary for pea processing.

TOMATO PROCESSING MACHINERY
- Soak tanks
- Rotary washers
- Scalders
- Roller inspection tables
- Peeling tables
- Screw type extractors
- Heating tanks and coils
- Tubular heaters
- And special machinery necessary for tomato processing.

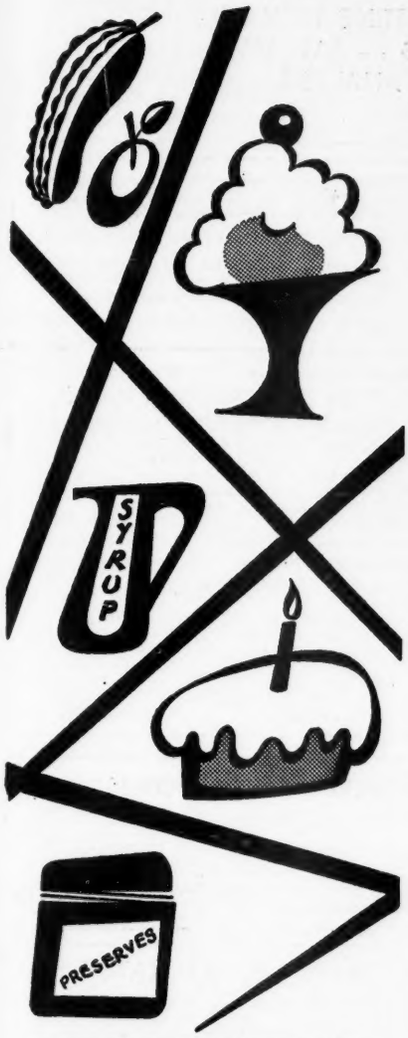
CORN PROCESSING EQUIPMENT
- Corn silkers (high speed)
- Corn mixers
- Double batch corn mixers
- And other equipment necessary for corn processing.

COOK ROOM EQUIPMENT
- Retorts
- Continuous cookers and coolers
- Perforated crates
- Hoists

Berlin Chapman

CANNING MACHINERY FOR ALL FOOD PRODUCTS

NATURAL
FLAVORING
MATERIALS
SINCE 1921



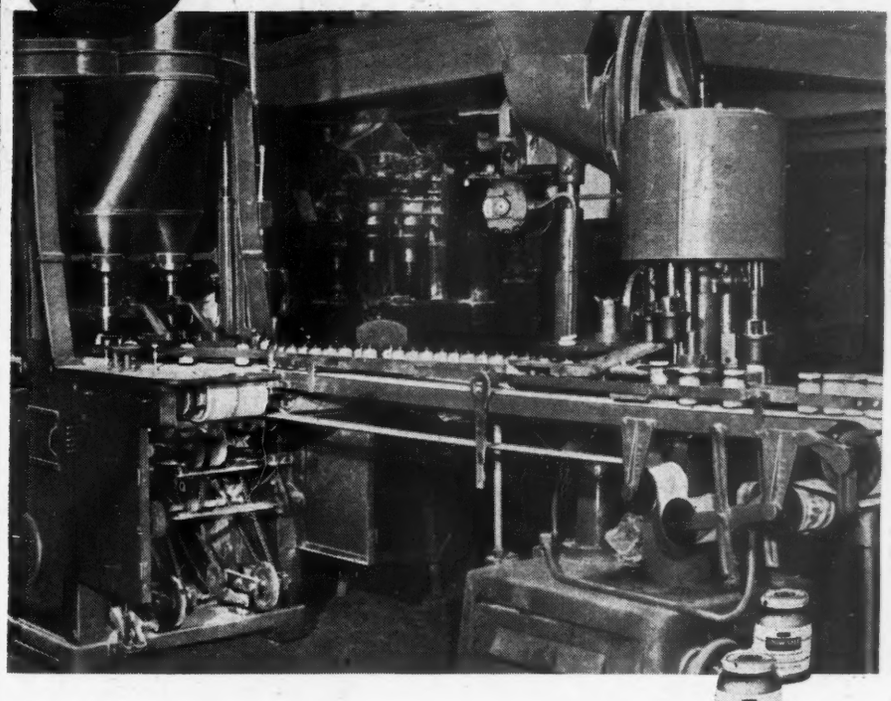
TRUE FRUIT CONCENTRATES
ESSENTIAL OILS
VANILLA CONCENTRATES
OLEO RESINS
TERPENELESS OILS

You'll want these pure, wholesome flavors for all your quality products . . . syrups, relishes, preserves, jelly powders, confectionery, ice cream, beverages, cake products and fondants. DREYER imitation and pure flavors are concentrated, possessing great strength and carrying power. Economical, too, a small quantity produces a delectable flavor.

SEND FOR SAMPLES AND CATALOG C
on your company letterhead

P. R. DREYER, INC.
1191 West 19th St. • New York 11, N.Y.

S&S at McKESSON & ROBBINS



The S & S HG 84 Duplex Heavy Duty Filling Machine answers their problems. Three sizes of jars are filled on one machine and fed into the automatic capping unit at the rate of about about 60-72 per minute. While filling with speed and accuracy the HG-84 vibrates to insure complete fill.

The HG-84 can also be supplied with "Auger-Vac"—the auger-vacuum system for dustless fill and tight pack—is available in various types. It fills not only jars, but cans or other air-tight containers with pulverized coffee, powdered milk, ice cream mix, malted milk, cocoa or numerous similar products, in the amounts desired. Full particulars on request.

STOKES & SMITH Co
4911 Summerdale Ave., Philadelphia 24, U. S. A.
FILLING • PACKAGING • WRAPPING MACHINES
Speeds to suit your needs — 15 - 30 - 120 per minute
"Better machines for better packages"

PROFESSIONAL SERVICES

PROCESSING PROBLEMS — PRODUCT DEVELOPMENT — MARKET RESEARCH — PLANT LAYOUT and DESIGN — PACKAGE DESIGN and TESTING MANAGEMENT — PUBLIC RELATIONS — GENERAL CONSULTING — PATENTS — CHEMICAL, BACTERIOLOGICAL and NUTRITIONAL ANALYSIS

PETER D. BARAKAUSKAS
Consulting Food and Agricultural Chemist
Specializing in all Food and Agricultural Branches
1605 Westminster Pl., Ann Arbor, Mich.

HOWARD LABORATORIES
Chemists and Bacteriologists
FOOD RESEARCH
750 N. Pleasant St. Amherst, Mass.

KING DESIGN & CONSTRUCTION CO., OF N. Y. INC.
Food Division: Dr. D. N. Lewin, Food Consultant
J. D. Lewin, Consulting Engineer
Design—Investigations—Evaluation—Consultation—Reports. Consultations in Cooking, Filling, Packing, Canning, Sterilizing. Conversion of Existing Facilities—New Plants.
40 Exchange Place. Ha. 2-4895 New York 5, N. Y.

EDWIN J. LOCKWOOD
Consulting Engineer
Specializing in Liquid Food Operations
Process and Factory Designs
Milk—Dairy Products—Liquid Foods
1000 North Division Street, Peekskill, New York

MODERN VINEGAR SERVICE
Large recirculating vinegar making units to fit any requirements. Design, Installation, Operation, Alterations, Consultation.
P.O. BOX 103, STATION M,
LOS ANGELES 32, CALIF.

The Real Value
of placing your unusual problem in the hands of a competent consultant is that it eliminates the elements of chance and uncertainty from the problem and provides real facts upon which to base decisions.

GUSTAVE T. REICH
Consulting Chemical Engineer
Development Continuous Processes
Carbohydrate Industry—By-Products
Plant Design — Waste Disposal
Carbon Dioxide
Packard Building Philadelphia 2, Pa.

J. E. SIEBEL SONS CO., Inc.
Biochemists - Analysts - Consultants
FOODS AND BEVERAGES
Research Problems..Vitamin Assays
Operating
SIEBEL INSTITUTE OF TECHNOLOGY
950-970 Montana St. Chicago 14, Ill.

FOSTER D. SNELL, INC.
Our chemical, bacteriological, engineering and medical staff with completely equipped laboratories are prepared to render you Every Form of Chemical Service
Ask for copy of Bulletin 8 W
302 Washington St. Brooklyn, N. Y.

JOHN I. THOMPSON & CO.
Consulting Engineers to the Food Industries
Mechanical, Management and Process Engineering, Investigations and Reports, Plant Layout and Design, Methods and Procedures.
921—17th St., N.W., Washington, D. C.

VAN DYK INDUSTRIAL CO.
Chemical Research & Engineering
NEW PROCESSES DEVELOPED FOR SPECIAL NEEDS
Substitutions for Raw Materials—Quality Control — P.H. Determination — Consultation — Filtration—Evaporation—Waste Disposal.
Bernardsville, N. J. BE. 8-1553

A. WEISSELBERG, M. E.
Designers of special equipment and complete plants
Quality Dehydration and Conditioning a specialty.
Established 1930
277 Broadway New York City

WERBY LABORATORIES, INC.
Chemists—Engineers
Consultation, Research, Development and Analysis of Food Products
88 Broad Street Boston, Mass.

ZUERCHER LABORATORIES
Creators of Distinctive Food and Beverage Formulae
Research and Consultation on Flavor Problems
2661 N. Teutonia Ave. Milwaukee 6, Wis.

LEGAL NOTICE

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of Food Industries, published monthly at Albany, N. Y., for October 1, 1946.

State of New York }
County of New York } ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared J. A. Gerardi, who, having been duly sworn according to law, deposes and says that he is the Secretary of the McGraw-Hill Publishing Company, Inc., publishers of Food Industries, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption ,required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, to wit:

1. That the name and address of the publisher, editor, and business manager is: McGraw-Hill Publishing Company, Inc.; Editor, Dr. L. V. Burton; Managing Editor, Dr. Haldane Gee; Business Manager, M. A. Williamson, all of 330 West 42nd Street, New York 18, N. Y.

2. That the owner is: McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York City. Stockholders holding 1% or more of stock: James H. McGraw; James H. McGraw, Jr.; James H. McGraw, Jr., Curtis W. McGraw and Edwin S. Wilsey, Trustees for: Harold W. McGraw, James H. McGraw, Jr., Donald C. McGraw and Curtis W. McGraw, all of 330 West 42nd Street, New York City; Edwin S. Wilsey and Curtis W. McGraw, Trustees for James H. McGraw, 3rd, Madison, New Jersey; Curtis W. McGraw, Donald C. McGraw, both of 330 West 42nd Street, New York City; Mildred W. McGraw, Madison, New Jersey; Grace W. Mehren, 536 Arenas St., La Jolla, Calif.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

J. A. GERARDI, Secretary.
McGRAW-HILL PUBLISHING COMPANY, INC.

Sworn to and subscribed before me this 24th day of September, 1946.

[SEAL] ELVA G. MASLIN.

(My commission expires March 30, 1948.)

LEGAL NOTICE

for Quick ANSWERS

to business problems, use the Searchlight Sections of:

American Machinist
Aviation
Business Week
Bus Transportation
Chemical Engineering
Coal Age
Construction Methods
Electrical Contracting
Electrical Merch.
Electrical World
Electronics
Engineering & Mining Journal
Engineering News-Record
E. & M. J. Markets
Factory Mgt. & Maintenance
Food Industries
Power
Product Engineering
Textile World
Welding Engineer

Classified Advertising Division

McGraw-Hill Publishing Co.,
New York 18, N. Y.

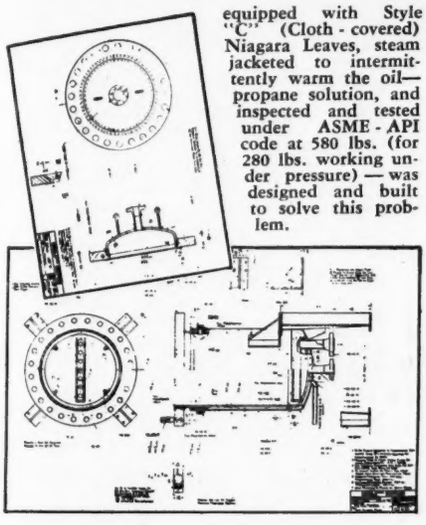
ONE OF THE WORLD'S LARGEST ENGINEERING CONCERNS PRESENTED THIS CLIENT'S

PROBLEM:

SEPARATE STEARIN from Fish Liver Oil Concentrates by FILTRATION

Propane (a gas) is normally used in the liquid phase to put fish liver oil into solution. At low temperatures and under pressure, the Stearin separates from the oil solution as crystalline globules.

A Stainless Steel NIAGARA FILTER SYSTEM



equipped with Style "C" (Cloth - covered) Niagara Leaves, steam jacketed to intermittently warm the oil—propane solution, and inspected and tested under ASME - API code at 580 lbs. (for 280 lbs. working under pressure) — was designed and built to solve this problem.

This high pressure NIAGARA FILTER SYSTEM filters the Stearin globules out of cold solution—the fish liver oil and propane filtrate being directed to process where the propane is separated, compressed and recycled. Then by pumping warm propane under maximum pressure 280 lbs., the Stearin in the filter cake is dissolved and the filter cleaned and ready for another batch. The Stearin is removed from the wash propane by evaporation, the propane again recovered, compressed and recycled.

THIS IS BUT ANOTHER EXAMPLE of Niagara's "Engineered Filtration" . . . of the filtration "know how" gained through years of training and experience in the successful filtration of numerous products over a long period of years.

IF IT CALLS FOR FILTRATION call for an "N.F.E."* . . . the complete engineering service from laboratory appraisal of the filtration characteristics of your product to producing the daily production requirements of your plant — at the lowest economical operating costs is available to you . . . at no obligation.

***"N.F.E."** — Niagara Filtration Engineer — a trained graduate engineer with years of actual field experience in chemical, food, fermentation and process industry filtration problems. Niagara Filter has a staff of N.F.E.'s available to assist you without cost or obligation.

Write for FREE 8 page folder on Niagara Filters!

niagara filter CORPORATION

3073 MAIN ST. BUFFALO 14, N. Y.

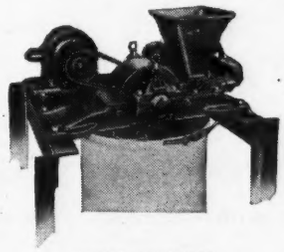
Rx for a grinding headache

A corner of our Test Grinding Department

Is finer grinding a problem with you? More uniform particle size? Less variation in your mixtures of pulverized materials? Lower milling costs? If these things have become a "headache" with you, here is a proved "prescription" for a solution to such problems.

1. **Send for your copy of our Confidential Test Grinding Data Sheet.**
2. **Upon receiving it, fill it out completely, returning it to us with a production sample of the material you desire to grind.**
3. **Your information will be carefully checked in our Laboratory against the data and experience gained through the making of over 43,000 tests on all kinds of materials, during the past 23 years.**
4. **Your material will then be given carefully tabulated test grinds on regular production MIKROS in our Test Grinding Department.**
5. **A complete report will then be rendered to you outlining the proper procedure for your operation, giving you full information as to our findings.**
6. **Definite recommendations will then be made as to the proper size and type of equipment you should use in your operation complete with adequate performance guarantees and specifications, based on the study of these test results.**

This procedure can provide you with an unfailing guide to improved pulverizing operations in your plant . . . a recommendation that will give you the only practical basis to keep fine and ultra-fine grinding from becoming a "headache."



MIKRO-PULVERIZER

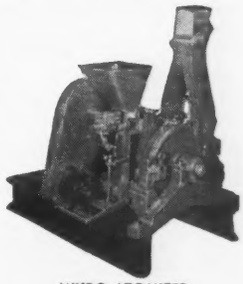
SEND FOR

copy of new 48-page illustrated

MIKRO-PULVERIZER and

MIKRO-ATOMIZER

Catalog



MIKRO-ATOMIZER

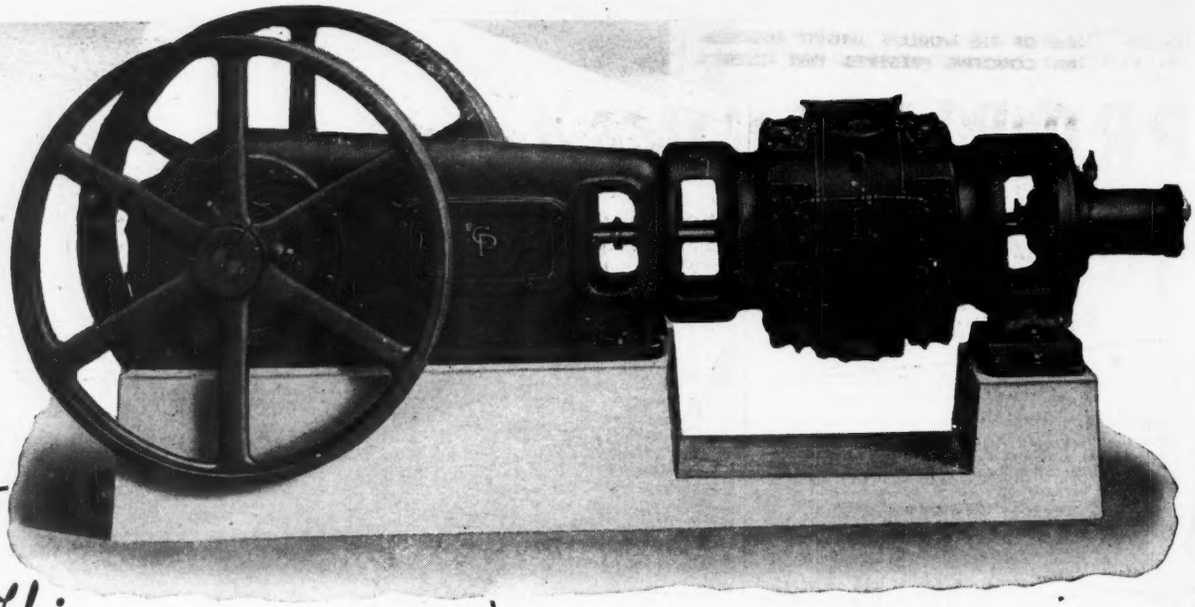
PULVERIZING MACHINERY COMPANY

97 CHATHAM ROAD • SUMMIT, N. J.

NOW . . . 2 TYPES TO MEET MOST PULVERIZING NEEDS

MIKRO-PULVERIZER (FINE) **-ATOMIZER** (ULTRA FINE)

Reg. U. S. Pat. Off.



This
COMPRESSOR

. . . delivers oil-free air

For uses where compressed air or gas must be free from oil, CP Oil-less Cylinder Compressors are ideal, since they require no oil, grease, or other cylinder lubricant.

Piston and rod, completely supported by crossheads, are full floating, removing all weight from cylinder walls and stuffing boxes. Thus long life of carbon piston rings is assured. Normal maintenance only is required — no need for periodic rotation of piston rings.

CP Oil-less Cylinder Compressors, arranged for belt, motor, or steam drive, are made in single and two-stage types, available in a wide range of sizes and ratings. Write for full information.

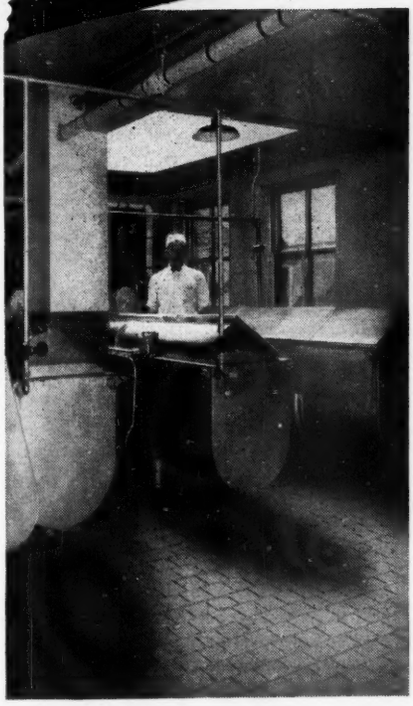
CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 6 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Protect Floors Against All Types of Corrosion with

NUKEMITE



NUKEMITE gives food plant floors complete protection against all corrosive conditions. Easily applied by conventional brush or spray methods, this synthetic resin coating quickly air dries to form an attractive, leak-proof film of strong adhesion, durability and immunity. It is unaffected by corrosive juices, sugars, syrups, lactic acids or frequent exposure to strong cleaning compounds.

As a general protective coating for piping, canning and processing equipment, structural work and walls, NUKEMITE is unexcelled. Its smooth non-porous surface lends itself readily to quick and thorough cleaning operations, discourages the growth or accumulation of bacteria, mold or fungi on its surface, and is in itself non-contaminating.

Descriptive literature or a complete NUKEMITE Trial Kit at $2.95 (Postpaid in U. S.) will be sent on request.

NUKEM

Nukem

Products CORP.

108 COLGATE AVE., BUFFALO 20, N. Y.

Federal

NOARK

MOTOR CONTROLS

MANUAL A. C. STARTER. Bulletin 404—available for motors up to 5 hp 220 v and 7½ hp 440-600 v.

built to meet the needs of the

FOOD INDUSTRIES

Federal builds dependability into every motor starter that bears the Federal name . . . through exclusive features that assure positive protection and unfailing performance. Federal Motor Starter — Bulletin 404 — typifies the high standards of design and manufacture that has helped to make Federal a "must" in important specifications throughout the food industries.

*JUST ONE OF THE MANY FEDERAL MOTOR CONTROLS FEATURED IN THE

FEDERALOG

. . . one of today's most important catalogs on Motor Controls, Safety Switches, Circuit Breakers, Service Equipment, Panelboards and Multi-Breakers. Keep a copy handy; mail coupon today!

FEDERAL ELECTRIC PRODUCTS COMPANY, INC.
50 Paris St., Newark 5, N. J. (Dept. F)

Please send a copy of the FEDERALOG to

Name_____

Company and Title_____

Address_____

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:

Not available for equipment advertising
15 cents a word, minimum charge $3.00
(See ¶ on Box Numbers.)

POSITIONS WANTED (full or part-time salaried employment only), ½ above rates.

PROPOSALS, 75 cents a line an insertion.

INFORMATION:

BOX NUMBERS in care of any of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance of four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED RATE:

The advertising rate is $7.20 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches —to a page F.I.

NEW ADVERTISEMENTS received by 10 A. M. December 18th will ap pear in the January issue subject to limitations of space available.

POSITIONS VACANT

GENERAL SUPERINTENDENT: To take charge of complete canning operations in a large food packing establishment on the East coast. Must be thoroughly familiar with all packing operations relating to the packing of tomato catsup, tomato products, condensed soups, pork and beans, and canned vegetables. State in detail qualifications, experience, training, salary desirable and when services are available. Company planning large expansion program which means unlimited promotional opportunities. P-959, Food Industries, 330 W. 42nd St., New York 18, N. Y.

CHEMIST: Well trained with wide experience in food field. Baking experience essential, knowledge of dairy and confectionery fields helpful. Will head up new laboratory unit. Excellent opportunity. Middle west. P-999, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

FOOD TECHNOLOGIST—Exceptional opportunity for a man between 30-40 in research service department at headquarters of large food concern in New York City. Position includes supervision of field quality control of certain products. Administrative ability with good background in food, analytical and physical chemistry is needed. Some knowledge of statistical methods. Five day week. P-130, Food Industries, 330 W. 42nd St., New York 18, N. Y.

(Continued on opposite page)

WANTED

Old established and aggressive company with national distribution has position open for a man with extensive experience in distillation and percolation of true fruit extracts and in the compounding of fruit flavors.

Must also have ability to assume complete supervision of this department.

Send qualifications and experience in detail to:

THOMSEN LABORATORIES
Dept. A., 425 Portrero Avenue, San Francisco, California

All replies will be held in strictest confidence.

HELP WANTED

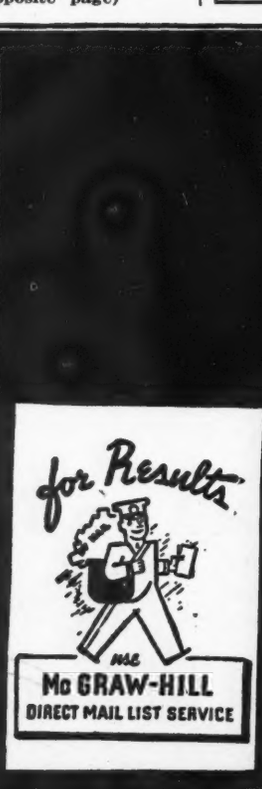
Assistant Plant Engineer

M.E. or Chem. 30 to 40 years of age. To understudy Chief Engineer in large midwestern food processing plant. Practical experience in steam, boiler and air conditioning required. Must be ambitious, aggressive and capable of taking over Chief Engineer's duties in very near future if necessary. Permanent with attractive salary. Reply in confidence, giving age, education, details of employment and earnings record, and when services are available.

P-994, Food Industries
520 North Michigan Ave., Chicago 11, Ill.

Additional Position Vacant Advertising on page 243

What Makes A Mailing *CLICK?*



Advertising men agree—the list is more than half the story.

McGraw-Hill Mailing Lists, used by leading manufacturers and industrial service organizations, direct your advertising and sales promotional efforts to key purchasing power. They offer thorough horizontal and vertical coverage of major markets, including new personnel and plants. Selections may be made to fit your own special requirements.

New names are added to every McGraw-Hill list daily. List revisions are made on a twenty-four hour basis. And all names are guaranteed accurate within two per cent.

In view of present day difficulties in maintaining your own mailing lists, this efficient personalized service is particularly important in securing the comprehensive market coverage you need and want. Ask for more detailed information today. You'll probably be surprised at the low over-all cost and the tested effectiveness of these hand- picked selections.

Direct Mail Division

McGraw-Hill Publishing Co., Inc.
330 West 42nd Street *New York, 18, N. Y.*

POSITIONS VACANT
(Continued from opposite page)

WANTED: Active Trained plant superintendent to accept full responsibility products and plant equipment of a dairy products plant employing 25 men and making high quality products. Must be capable of using Mojonier laboratory. Also must have thorough knowledge of refrigeration and be able to get good plant sanitation and high degree of labor loyalty and cooperation under paternalistic system. Man 30 to 45 preferred. Excellent living conditions in midwest college town of 6000. State fully experience, qualifications, and present salary in first letter. Give references. Replies held strictly confidential. P-121, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

WANTED: Canning Plant Superintendent for Grapefruit Sectionizing with general knowledge of canning. Southern Fruit Dist., Inc. Box 671 Orlando, Florida.

ADMINISTRATIVE and Supervisory position in connection with the manufacture of organic chemicals. Minimum 5 years experience. B.S. or Ph. D. required. Write, giving full information regarding education and past experience. P-129, Food Industries, 330 W. 42nd St., New York 18, N. Y.

EMPLOYMENT SERVICE

EXECUTIVE, Technical, Sales, Office—Qualifications of selected applicants submitted without charge or obligation. Licensed and bonded. National Employment Service, 200 Time Bldg., Minneapolis 3, Minn.

POSITIONS WANTED

FOOD PRODUCTS Executive, with extensive experience in production, development and technical control of foods. Available as production superintendent, chief chemist or general manager. PW-104, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

EXECUTIVE CHEMIST—Bacteriologist M.S. degree, age 40, married. Educated in commerce and science in Mid-West Universities. Experience includes chocolate, cereals, milk, and distillery products including processing, pilot plant operation, purchasing, technical selling, and laboratory direction. Plant Manager or direction of research and control. PW-131, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

FOOD CHEMIST, 40, Ph.D. Over fifteen years experience, development, formulation, research, quality control and production. Canned, frozen foods, juices, salad dressings and other specialties. PW-132, Food Industries, 330 W. 42nd St., New York 18, N. Y.

NATURAL BORN Salesman desires position with quality frozen food distributing organization developing home delivery routes and systems. Chicago & Vicinity. PW-133, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

EXECUTIVE ASST. Desires change. Twelve years' experience administrative work and selling in Latin America, good knowledge of food processing and can making machinery, speaks and writes Spanish and Portuguese. Position with future is primary objective. Willing to work hard for it. PW-134, Food Industries, 330 W. 42nd St., New York 18, N. Y.

EXECUTIVE ASSISTANT, or Sales Assistant: 37, married, vet, college and graduate work, 8 years wholesale groceries sales, 5 years retail, 2½ years administrative personnel; desires position with food firm—manufacturers, distributors, or brokers—, or with advertising house in food merchandising department. PW-135, Food Industries, 330 W. 42nd St., New York 18, N. Y.

FOOD TECHNOLOGIST AVAILABLE

Mayonnaise, Frozen Foods, Cannery Experience—ex U.S. Food & Drug Inspector M. S., age 36. Broad experience. Now employed by a food machinery company in West. Wants production, quality control or sanitation work in food processing plant West or South.

PW-137, Food Industries
621 South Hope Street, Los Angeles 14, California

"MEN WITH DEGREES"

Research Director—Foods $7500
Flavor Chemist—Fruits $6000
Dairy Technologist—$6000
Baker Technologist — Chem. Engr. $7500
Paper Mill Chem. Engr. $4200

Write or Wire

SHAY EMPLOYMENT AGENCY
30 W. Washington Cen 9800
Chicago, Ill.

WANTED

CREAM FOREMAN

Large midwest concern requires experienced man to take charge of quality cream making. Should have at least 5 years' experience in cream making. Permanent position with attractive salary and opportunity for advancement. Reply in confidence, giving age, education, full details of employment and earnings record.

P-993, Food Industries
520 North Michigan Ave., Chicago 11, Ill.

WANTED

Chemist or Food TECHNOLOGIST

Wanted by large Eastern food processor thoroughly trained chemist or food technologist. Desire applicant with several years food processing experience for research position. Broad outlook and ability to do independent work desirable. Excellent opportunity with salary dependent upon ability, training and experience.

P-125, Food Industries
330 West 42nd St., New York 18, N. Y.

WANTED

JUNIOR ENGINEER

Must be familiar with layout & production problems in food processing industries. Some drafting ability required. Excellent opportunity with growing organization in New England.

P-126, Food Industries
330 West 42nd St., New York 18, N. Y.

SELLING OPPORTUNITIES OFFERED

SALES MANAGER: To take charge of sales of canned vegetables and specialties such as pork and beans, soups, catsup and other tomato products for food packer located on the East coast. Must have brokerage and trade contracts and know merchandising and advertising. Liberal salary to start, with opportunity for advancement. State in detail qualifications, experience, references, and when services are available. SW-960, Food Industries. 330 W. 42nd St., New York 18, N. Y.

SELLING OPPORTUNITIES WANTED

MANUFACTURERS REPRESENTATIVE: Mechanical engineer and equipment purchaser in world known canning plants for twenty years wishes to open office in Baltimore, serving canning and allied industries in Maryland and surrounding area. Service and professional advice included in contemplated establishment. Address Professional Engineer, State of Maryland, RA-113, Food Industries, 330 W. 42nd St., New York 18, N. Y.

WELL-KNOWN BRITISH Food Distributors with national sales force desire to contact manufacturers of all types of food products in cartons or cans who are interested in selling their goods in the United Kingdom. We prefer to deal with small manufacturers producing best quality foodstuffs who have original ideas on marketing and who will be guided by our experience of the British market. Please write full details to RA-114, Food Industries, 330 W. 42nd St., New York 18, N. Y.

BUSINESS OPPORTUNITIES

PLANT WANTED. Food chemist wishes to purchase preserve plant producing jams, jellies, syrups and allied products. Please state sugarbase and particulars. BO-110, Food Industries, 330 W. 42nd St., New York 18, N. Y.

CALIFORNIA FOOD processing and packaging plant. $200,000 plus $40,000 inv. Sales $5,000 day up. Owner retiring. Address 119 N. Eastern Ave., Los Angeles, Calif., Angelus 6464.

CAPITAL WANTED: Experienced Refiner of corn products seeks capital for erection of plant to manufacture starch corn syrup, feed and oil. BO-136, Food Industries, 330 W. 42nd St., New York 18, N. Y.

WANTED

SALES MANAGER

FOR LEADING FOOD MANUFACTURER

Large, old-established food firm with nationally known brand name offers outstanding opportunity to top-notch man with substantial experience and record of accomplishment. Must be live wire, thoroughly seasoned and intensively familiar with retail grocery store and institutional field. Salary commensurate with ability. Write in confidence giving age, background in detail, salary, etc..

SW-119, Food Industries
330 West 42nd St., New York 18, N. Y.

REPRESENTATION IN

SWITZERLAND

Desire to secure exclusive representation of

CHEMICAL TECHNICAL, CHEMICAL PHARMACEUTICAL & FOOD PRODUCTS

(Information as to outstanding experience can be obtained by writing to Wm. H. Fleissner, 215 West Portal Ave., San Francisco 16, Calif.)

WALTHER SCHOENENBERGER
Postfach 5, Rheinfelden, Aargau, SWITZERLAND

California Food Processing and Packaging Plant

$200,000 plus $40,000 inv. Sales $5000 day up. Owner retiring. Address
119 N. Eastern Ave., Los Angeles, Calif.
ANgelus 6464

YOUR ASSETS and CAPITAL STOCK are WORTH MORE NOW

We are willing to

PAY YOU CASH

For Your

- **INDUSTRIAL PLANTS**
- **MFG. DIVISIONS or UNITS**

We are principals acting in our own behalf. All transactions held in strictest confidence. Personnel retained wherever possible.

ADDRESS: Box 1219
147 W. 42nd St., New York 18, N. Y.

GET MORE FOR YOUR SURPLUS EQUIPMENT

List it with our bureau And Sell Directly to the next user

50,000 Manufacturers Get Our Offerings Regularly. They need such units as

LABELERS DICERS PEELERS
RETORTS WASHERS KETTLES
DRYERS STILLS MIXERS

or what have you to sell?

For Quicker Action and Better Price Send Full Details and YOUR price to

EQUIPMENT FINDERS BUREAU
6 Hubert Street New York 13, N. Y.

WANTED

SPECIFICATIONS AND ESTIMATES

With time of delivery for up-to-date automatic machinery for Biscuit Factory of two and four tons capacity per eight hours shift, to be started in India. Reply in detail to

M-120, Food Industries
330 West 42nd St., New York 18, N. Y.

FOR SALE
IMMEDIATE DELIVERY

1 New Stainless Steel, Low Temperature, High Speed Circulating Evaporator, Single Effect, Capacity 75 gallons per hour.

1 New Stainless Steel Tank, Capacity 200 gallons, with Coil and Gear Head Motor Agitator.

2 New Stainless Steel Closed Top Storage Tanks, Capacity 200 gallons.

1 Used Devine Single Stage Vacuum Pump, complete with Motor on Base.

YEAST PROCESSING EQPT. CO.
Post Office Box 68
DOWAGIAC, MICHIGAN

Do You Need? Want To Sell? } SURPLUS EQUIPMENT MACHINERY

SPECIALISTS

We are specialists in used, rebuilt and new Packing House and Food Processing machinery and equipment.

Write for our Weekly Bulletin.

BARLIANT AND COMPANY
BROKERS-SALES AGENTS
7070 N. Clark St., Chicago 26, Ill.
Sheldrake 3313

1—2000 lb. capacity Ford Truck (Mobilift) with lift 108"
1—8x7 Gardner Single Vertical Cylinder Air Compressor
1—15 H.P. Vertical Steam Engine
1—80 H.P. Vertical Steam Boiler

S. E. W. FRIEL
Queenstown, Maryland

FOR SALE

1—Stokes Smith envelope sealer
1—Bunn automatic typing machine, for packages 10x8x2 or smaller
1—Sperry 18-plate 18" iron filter, open del.
1—Day 25-gallon Marshmallow beater

THE JULEP CO.
353 W. Grand Ave., Chicago 10, Illinois

DISMANTLING?

Equipment Dismantled & Re-erected
Dismantled & Removed
Men, Tools, Insurance. 30 years experience

G. M. LINDER
40-18 216th St. Bayside, New York
Phone: Bayside 9-2121

WANTED

WHERE TO STORE FROZEN FOODS

14 *"City Ice"* COLD STORAGE WAREHOUSES

Strategically situated to handle your FROZEN FOODS

THE CITY ICE & FUEL CO.
COLD STORAGE DIVISION
33 S. CLARK ST., CHICAGO 3

WANTED
FOOD PLANT

Will purchase actively operating Food Manufacturing Plant complete with equipment, machinery and organization. Any size. Please furnish information in full. Confidential.

BO-997, Food Industries
330 West 42nd St., New York 18, N. Y.

WANTED
AUTOMATIC OR SEMI-AUTOMATIC PACKAGING LINE

To bottom seal, line with wax paper, fill, top seal, and tight wrap 1¼# and 2½# packages. Will consider one line for each size package, or single adjustable line. Please contact us if you have all or any part of this equipment.

CHELSEA MILLING COMPANY
Chelsea, Michigan

The strategic center for storing, distributing and processing frozen foods for New England and New York States.

Zero-storage. Sub-zero blast-tunnels, 50' long. Advanced humidity-control. RR. Siding Insulated Truck services.

500,000 cu. ft. space for storage and processing.

DERBY COLD STORAGE
324-332 Derby Ave., Derby, Conn.
Phone: Derby 2850

WE WILL BUY AT ANY POINT YOUR EMPTY WOOD BARRELS, STEEL DRUMS AND BAGS. ALSO WE SELL RECONDITIONED BARRELS AND STEEL DRUMS.

BUCKEYE COOPERAGE COMPANY
3800 Orange Ave., Cleveland 15, Ohio

WANTED
New or used
CIDER PRESS
with 54" racks. State age, condition, price.

MAX AMS, INC.
376 Greenwich St., N. Y. C. 13

WANTED
Cherry-Burrell ¼# wrapping machines. Mechanical condition not important. Wire

G & H EQUIPMENT COMPANY
609 York Street, Denver Colorado

WANTED
Peeler, grinder and chopper for carrots. High speed filler for 8 oz. cans.

SARDIK FOOD PRODUCTS CORP.
SHIRLEY, INDIANA

WANTED
LABELING MACHINE
FOR CANS

ALEXANDER TRADING COMPANY
403 E. 101 St. New York, N. Y.

WANTED
COPPER VACUUM PAN

3-foot or 4-foot Copper Vacuum Pan in good condition, complete with pumps.

W-127, Food Industries
520 North Michigan Ave., Chicago 11, Ill.

QUAKER CITY COLD STORAGE CO.

PHILADELPHIA, PA.
3 WAREHOUSES 3
Proper Temperature For Frozen Foods

WANTED
Roll Through Labeler

One Roll Through Labeler new or used any standard make for 1-lb. coffee jars. Maximum diameter 4½" height 6½" label size 14½"x2-¾" with or without motor. Please airmail details and statement of mechanical condition when answering.

DUNCAN COFFEE COMPANY
P. O. Box 2079 Houston, Texas

For Every Business Want
Think "Searchlight" First

"Searchlight" — classified Advertising — "spots" current Employment, Equipment and Business Opportunities—both offered and wanted—in the industry served by Food Industries.

"FIRST" IS THE WORD FOR MACHINERY

first (fêrst), adj. foremost in place, rank, dignity, time, excellence, etc.. earliest; most important; chief. *Webster's Dictionary.*

You'd think Mr. Webster was a buyer of "FIRST" Machines, to read his definition! FMC gained first place in the field by saving our customers' TIME, giving EXCELLENT value, being EARLY with the most IMPORTANT machines and serving the CHIEF American industries. When you think Machinery, think "FIRST" and you think straight thru' to highest production.

A cross-section of **FMC** *offerings--all* **FIRST**-*rate values--check!*

4 STERILIZERS OR RETORTS
6' x 14'—15 lbs. pressure.

COLLOID MILLS
3—Manton-Gaulin 8" S.S., 10 HP, 3600 RPM.
1—Eppenbach S.S. Model C Vertical; 5 HP, 3 phase AC Motor.
2—Eppenbach S.S. Model B Vertical; 1½ HP, AC Motor.
2—Charlotte No. 3, S.S. and Monel; 3 HP Motors.
2—New Stainless Steel, Chemi-Colloid; 30 and 50 HP Motors.
1—Marco Peanut-butter Homogenizer; 7½ HP Motor.

5 ALUMINUM CONDENSERS
Tubular Type; 24" x 60".

DRYERS
5—Buffalo and Devine Vacuum Shelf; 42" x 42" to 60" x 160".
2—Proctor & Schwartz single pass apron; 66" x 21' long, 8' x 77'.
1—Huhn Rotary Steam Dryer; 3' x 13', continuous operation.

FILLERS
For Dry Powders—Stokes, Stokes & Smith, National Packaging, Triangle, etc.
Haller Rotary for Juices; 7, 14, and 18 spout FMC Straight Line.
Rotary Syphon, Pneumatic Scale, Samco Jr., and Automatic.
FMC new Stainless Straight Line.
Buffalo and Vol-U-Meter Can Fillers.

STEAM JACKETED KETTLES
Stainless and Copper, all sizes; immediate shipment.

LABELERS
6—World and Ermold Semi-automatic.
4—Burt and Knapp; for Cans, Glass, etc.
2—Straight Line Fully automatic; Pneumatic and Weeks-MacDonald.

COMMINUTING MACHINES
50—Fitzpatrick Model "D", Stainless.

ATTRITION MILLS
Bauer, Robinson, Sprout-Waldron, Single and Double Runner.

MIXERS FOR MEAT PRODUCTS
3—Hottman No. 3 and 1—Boss No. 4.

MIXERS (Dry Powders)
Prompt Shipment—all sizes Ribbon Type, horizontal all steel mixers.

PACKAGING EQUIPMENT
Fillers for liquids, pastes and powders.
Labelers for all types of containers.
Envelope and Bag Sealers.
Wrappers, Cartoners, Conveying Lines.

55 TABLETING PRESSES
Stokes and Colton, Single Punch and Rotary.

STILLS (including columns, vacuum pans)
12—Vacuum Stills, Steel Jacketed, Coil Heated. Aluminum and Copper.
1—Copper Gin Still, 5' dia., 300 Gal.
1—Buflovac Nitric Still, 80 BBL cap., 96" x 108" with Oil Burner.
1—Copper, Alcohol Distillation Unit, 36" diameter, 23' high bubble cap, sectional type.
1—Steel, Alcohol Concentrating Column, 62" diameter, having 24 sections, 14" high, capacity—400 gal., 190 proof.
1—Badger Fractioning Column, 24", 6 sections, 20" all over height.
1—Vulcan Rectifying Column, 24" diameter x 36' high, complete with condensers, dephlegmators, and calandria tube section.
3—Copper Vacuum Pans, calandria type, 10' and 11' dia.
1—Steel Water Still, 5000 gals. per day, 40" x 8', with condenser coils.
1—Copper Vacuum Pan, 10' dia. calandria type.

TANKS (For storage, processing, jacketed)
Vertical, Horizontal, Rectangular, Steel, Stainless, Copper, Rubber-lined, Lead, etc. State Specifications.
17—Glass Lined Rectangular Tanks, 5 with aluminum coils, 78" x 132" x 33".

Think "FIRST" also when you Sell your surplus machinery

Nobody pays more than FMC for Good Used Equipment

FIRST MACHINERY CORP.

157 HUDSON ST. **WOrth 4-5900** **NEW YORK 13, N. Y.**

UNION STANDARD EQUIPMENT

Rebuilt-Guaranteed

Vacuum Pans, with and without heavy duty agitators, sizes 20", 3', 4', 5', 6'. Glass-Lined Vacuum Pfaudler 150 gallon and 125 gallon Pan with heavy duty agitator.

Mixers—F. J. Stokes, J. H. Day, New Era, Hottman, etc. From 2 gallons to 450 gallons, with and without jackets, single and double arm agitators.
40 gal. Pony Mixer, Motor Driven. Day 275 gal. Double Arm Mixer, M.D.

Mullers or Chasers—4', 6' and 9' sizes. and Chasers: Putty Chasers, Ross 5' and N.E. New 7' Machine.

Roller Mills—Day, Lehman 12" x 30", Kent 9" x 24", Soap Mills—N. E. Heavy Duty.

Grinders & Pulverizers—Three NEW Mikros Model, 1 SH, 2-Mikros 4th, Schutz O'Neill, Prater, Mead—Cage Mills or Disintegrators.

Sifters—Gayco 4' Air Separator and Sifter, Allis-Chalmers Low Head.

Filter Presses—Shriver, Oliver Sweetland, Johnson 12", 24", 30" sizes. Open and closed delivery type. Write detailed requirements.

Jacketed Kettles—with and without agitators copper, aluminum and stainless steel. Give full requirements. Vertical Mixers, Hobart, Read, Century.

Centrifuges—Tolhurst 20" and 26", Cresson—Morris 40" Basket Centrifuge.

Wrapping Machinery—Package Machinery, American Machine & Foundry, Hayssen, Gellman and others. Send samples with requirements.

Labelers—World Fully Automatic.
Ermold and Oslund Semi-automatic Labelers.

Fillers—Karl Kiefer Rotary Visco U. S. Bottlers Acme C-10 N. E. High Speed Viscous and Semi-Viscous Filler Filler Mch. Co. Stainless Steel Piston.
Single Piston Stainless Steel Filler with automatic conveyor feed.

OVER 5,000 MODERN MACHINES IN STOCK

Send for Our Latest Catalog

Premier Model U-3 8" Colloid Mill with 10 H. P. Motor.

WRITE—OR WIRE US COLLECT

UNION STANDARD EQUIPMENT CO.
318-322 Lafayette Street New York 12, N.Y.
Cable Address: "CONFECMACH"

WE PAY CASH FOR SINGLE MACHINES OR ENTIRE PLANT

SPECIALS

1—Stokes Impregnating Unit—4 ft. x 6 ft. Vertical Kettle with Quick Opening Cover—4 ft. x 6 ft. Vertical Circulating Tank—Unit Surface Condenser 6"x6" Vacuum Pump & Worthington Circulating Pump with Explosion Proof Motors.

DEEP FREEZE UNIT

1—Cascade Defreeze 120 Santocel with 24" dia. x 30" deep cabinet, 2 motor driven compressors, receivers, coolers controls and temperature recorder complete.

AGITATOR DRIVES

1—Falk Reduction Drive ratio 18.8 to 1 with 5 H.P. Imperial Motor. 220 volt—3 phase—60 cycle.
1—General Electric Vertical Gear Reduction. Output Speed 5 R.P.M.—7½ H.P. G.E. totally enclosed Motor—220 volts—3 phase—60 cycles.

KETTLES

3—Copper Tin-Lined Cauldron, 145 Ga. Capacity.
1—25 Gal. Cast Iron Jacketed Kettle, Agitator.
2—12" dia. x 36" deep jacketed steel kettles, aluminum lined, with agitator, drive tight and loose pulleys. Capacity 20 gallons.
1—Stainless steel jacketed kettle. 10" dia. x 20" deep—mounted on stand for tilting.
1—Cast Iron jacketed kettle 24" dia. x 18" deep with agitator, drive tight and loose pulleys.
1—100 Gal. Jacketed Copper Kettle with Stands and Cover.
2—20 Gal. Jacketed Stainless Clad with Stands.

FURNACE

1—Lydon Glass Annealing Electric Furnace with Temerature Controls. ¾ H.P. Motor, Circulating Fan.

PULVERIZERS

1—No. 0000 Raymond Impact Pulverizer, with 10 H.P. motor—220 V.—3 ph.-60 cy.—30" mechanical Separator with 2 H.P. motor—Tubular Dust Collector—Cycle Collector—Screw Conveyor.

ELECTRIC LIFT

1—Barrett Cravens Electric Lift Truck, 2000# Capacity, 12 foot Lift, 18"x42" Platform with 2 H.P. 3 phase Motor & Automatic Controls.

VACUUM PUMPS

2—Devine Rotary Valve Type—Size 10" x 10", 113 cu. ft. displacement, pulley drive.
2—Devine Rotary Valve Type—Size 8" x 6", 52 cu. ft. displacement, pulley drive.

EMSCO
EQUIPMENT COMPANY
EMIL A. SCHROTH, OWNER
41 HYATT AVE., NEWARK 5, N. J.
PHONE MITCHELL 2-3536

2—Pneumatic Scale 6-Head Screw Cappers
1—Jones Automatic Cartoner
2—Sharples #6 Pressuretite Centrifuges
1—Watkins Basket Centrifugal
3—Standard Knapp Compression Units, 4', 8', 23'
1—Tubular Condenser, 410 sq. ft.
2—Belt Conveyors 6" wide, 117'6"
1—Bucket Elevator 100', 6" wide
1—Cast Iron Vacuum Pan, 900 cu. ft.
1—Copper Vacuum Pan, 1420 cu. ft.
2—Standard Knapp Carton Sealers
1—85 Gallon Copper Jacketed Kettle
1—Milwaukee 10 Spout S. S. Filler
1—Milwaukee 6 Spout Filler and Capper
1—Creamery Package 14 Spout Filler
1—Consolidated Automatic Powder Filler
1—Hoepner Semi Automatic Powder Filler
5—Syphon Fillers, 6, 8, 12, 18 Spout
30' Belt Conveyors 22" wide

NEW EQUIPMENT

Stainless Steel Steam Jacketed Kettles
Bronze & Stainless Steel Vacuum Fillers
Solid Roller & Skate Wheel Conveyors
Pumps, Centrifugal & Rotary
Stainless Steel Storage & Mixing Tanks
Industrial Filters
2—Oliver Hopper Dewaterers, 8' dia. x 6' face

We Purchase Your Surplus Equipment

Write For Latest Stock List

PERRY EQUIPMENT CORP.
1511 W. THOMPSON ST. • PHILA. 21, PA.

J. H. Day Half Bbl. Tilting Type Dough Mixer, motorized.

4—Savage 60 gal. Stm. Jcktd. Copper Kettles, with agitators.

U. S. Stainless Steel 10-spout Vac Filler.

1—Knapp Adjustable Labeling Machine.

1—Burt Labeling Machine.

2—Urschell Continuous Vegetable Peelers.

2—Buffalo #32 Silent Cutters.

1—World Semi-automatic Labeling Machine.

MACHINERY AND EQUIPMENT CO.
705 BRANNAN ST. SAN FRANCISCO 3 CALIFORNIA

Market 0234

FOR SALE

PERCOLATOR

One Hadesty Percolator. Solid copper, iron stand. Tin lined and gas heater. Capacity, 120 gal. Write

LOCHEAD MFG. COMPANY
912 Allen St. Louis, Mo.

As for the past 30 years . . .

"Consolidated"

Sends Season's Greetings
and Best Wishes For Peace and Prosperity

1—Horizontal Dry Powder MIXER, 1500#, bottom jacketed, m.d.
5—Double and Single arm Mixers, jacketed and unjack., up to 500 gal. cap.
2—NEW UNUSED BAKER PERKINS MIXERS, 150 gallon capacity, 100 gallon working capacity, with double sigma blades, steam jacketed, size 15, style VI, type BS. Equipped with Hydraulic Tilting Device, Roller Bearings throughout.
1—No. 7 Sweetland Filter with Copper leaves.
6—Filter Presses P & F; recessed; to 42" square.
6—DeLaval and Sharples Supper Centrifuges.
1—Mechanical 4x8' Lard Rolls, m.d.
2—60 gallon Copper, jacketed KETTLES.
6—Dopp cast iron; steam jack. Kettles, up to 500 gal. capacity, some with agitators.
3—Pfaudler 250 gallon glass lined Kettles.
1—Groen 100 gallon Stainless Steel steam jacketed Kettle.
1—Groen 25 gallon Stainless Steel steam jacketed Kettle.
2—Glass Lined Kettles, 200 gal. capacity, 42" dia. x 36" deep straight side, or 42" x 42" overall depth.
2—McDonald Auto-straight line Labelers M.D.
1—World straight-a-way automatic Labeler.
2—Ermold Semi-auto. Labelers m.d.
3—Jones & Anderson Cartoning Machines.
1—Robinson 18" Attrition Mill; 2 Bauer 22" 15 H.P. motors.
23—New, unused 150 gallon Stainless Steel open top, TANKS, 36" diameter, 48" deep, Cone bottoms and 4" bottom outlets.
4—100 gal. Copper TANKS.
2—150 gal. Aluminum Tanks, cone bottom.

SPECIAL

Aluminum Vacuum Stills, Kettles, Tanks

3—Closed jack. agitated Kettles, with coils; 1—1200 gal., 1—980 gal.

1—1200 gal. closed jack. Kettle, or Vacuum Still.

3—Closed jack. agitated Kettles or Vacuum Stills.

1—350 gal. closed jack. agit. Kettle.

1—80 gal. jacketed open Kettle.

29—250 gal. NEW closed horizontal storage TANKS, oval shaped, approx. 46" and 28" by 61" long, 16" round manhole in top, ⅛" plate. New, unused.

3—282 gal. Steel Glass Lined Tanks, 36" dia. x 60" deep.
2—250 gal. Steel Glass Lined Tanks, 42" dia. x 42" deep.
2—28"x60" Atmospheric Double Drum Dryers, complete.
1—250 gal. Copper jack. agit. closed Kettle or Vac. Still.
2—4' x 9' Allbright-Nell Atmospheric Double Drum Dryers.

2—Albright-Nell 4' x 9' Lard Roll with Reeves drive.
1—No. 1-SH 8" Micro Pulverizer.
1—Gruendler-Master Baby Pulverizer, motor driven with 2 H.P. motor.
1—Pneumatic Scale 6 Head Capper, motor driven.
1—Devine Vacuum Shelf Dryer with 10 shelves 40 x 42".
2—Buffalo 6 diameter vacuum and atmospheric Crystallizers.
1—Buffalo 3' diameter Crystallizers.
1—J. H. Day Auger Filler and Packer.
1—U.S. Colloid Mill, with 2-10 HP motors.
2—50 gallon Copper, jacketed VACUUM PANS, with condensers.
1—400 gallon Copper, jacketed VACUUM PAN, with condensers.
1—25 gallon Copper, jacketed VACUUM PAN with condensers.
1—6' Mojonnier Vacuum Pan, copper coils, complete with Condenser, Vacuum Pump.
50—Copper PERCOLATORS, up to 250 gallons capacity.
1—Karl Kiefer Bottle Washer 72-spout, motor driven.
3—Pneumatic Scale fully automatic, 60 per minute Packaging Units.
1—York 500 GPH Homogenizer with Bronze Head. Direct motor driven with 15 HP, AC motor.
1—Morgan six-tract Nailing Machine.
2—Devine 4' x 25' Rotary Vacuum Dryers.

THE KEY TO SAVING TIME AND MONEY

FOR OVER A QUARTER CENTURY A SYMBOL OF CONFIDENCE

CONSOLIDATED PRODUCTS COMPANY, INC.

OFFICE: 13-17 Park Row, New York 7, N. Y.
SHOPS: 335 Doremus Ave., Newark, N. J.

Send for "CONSOLIDATED NEWS" listing Complete Stock

FOR SALE

32x90 Buflovak Double Drum Dryer.
100 & 150 gal. S.S. Mix Tanks, water jkt.
60 gal. Copper Jkt. Kettle, 30"x26".
300 & 400 gal. Copper Jkt. Kettles, agit.
50 gal. Pfaudler Tank, clamped cover, 30"x20".
100 gal. Pfaudler Tank, Jkt., agit., 30"x36".
300 gal. Pfaudler Tank, Jkt., 42"x48".
200 gal. Pfaudler Tanks, water jkt., 38"x42".
Keifer Visco Filler, gear type.
50 to 400 gal. Homogenizers or Viscolizers.
Hottman Mixer, 30"x60"x18".
Stokes Granulating Mixer, 100 lbs. capacity.
Hobart Food Cutter 1/3 H.P.
York Int. Tube Cooler, 20—1½" Inconel tubes.
1000 gal. Copper Tank, 6'x6', open top.
10 H.P. Vert. Tubular Boiler, Coal fired.
New 1 gal. S.S. Laboratory Autoclaves.

Send Us Your Inquiries

LESTER KEHOE MACHINERY CORP.
1 East 42nd Street, New York 17, N. Y.
MUrray Hill 2-4616

FOR SALE

6—NEW STAINLESS STEEL & STAINLESS STEEL CLAD JACKETED KETTLES, 80 gal. cap.

18—New Stainless Steel Storage & Mixing Tanks, 100 gal. cap., 30" dia. x 36" high on shell.
1—C. C. & S. 4 head Crowner.
3—Horix Catsup Fillers, with conveyors and chain, 14 oz.—gal.
9—Direct Gas Fired Jacketed Kettles, 60 gal. cap.

GIRARD MACHINERY & EQUIP. CO.
949 N. 9th St. Phila. 23, Pa.
LO. 3-6744

FOR SALE

2—20" Sprout Waldron 15 hp. Attrition Mills.
2—Packomatic Powder Fillers and Sealers.
2—Powder Mixers: 2000# Essmueller, 3000# Davis.
5—Anderson Vegetable Dicers, Model 2.
2—Tolhurst Copper basket Centrifugals: 26-40".
4—Water Stills, 1, 3, 10, 25 GPH.
1—Food Mchry.—8-track Nailing Machine.
2—Burton closed drum Dry Mixers.
8—(New) Stain. Steel jac. Kettles: 60 and 200 gal.
1—Revolvator port. elec. Elevator, 800#, 16'.
1—300 gal. closed jac. ag. glass lined Tank.
1—Werner & Pfleiderer Dough Brake.
1—No. 600 DeLaval Clarifier.
5—250 gal. closed Aluminum Tanks. (New).
2—Dough Mixers for macaroni mixing.
2—Day auger Powder Fillers.

Send us your inquiries, also your list of surplus equipment, which we purchase for cash.

LOEB EQUIPMENT SUPPLY CO.
908 N. Marshfield Ave. Chicago 22, Ill.

FOR SALE

1 Marco Kombinator & Homogenizer

With all equipment, brand new, never been used, approximately 200 Gallons per hour.

FS-966, Food Industries
330 West 42nd St., New York 18, N. Y.

FOR SALE

JAR SCREW CAPS

100,000 58 mm. Lithographed with name
Very reasonable

ALEXANDER TRADING COMPANY
403 E. 101 St. New York, N. Y.

FILTER

#4357-A, —1#7 Sweetland Filter, good condition, fitted with 27 iron leaves on 3" center. Write

E. K. SPRAGUE
124 Third Avenue Pittsburgh 22, Pa.

IN STOCK!

3—NEW Rodgers Auger Type Powder & Package Fillers
1—Filler Machine Co. 4 Spout Filler
1—Kiefer No. 3 Piston Type Filler, 32 oz.
5—World and National Labelers
1—Knapp Can Labeler

3—Copper Vacuum Pans, 4', 5', 7' dia.
2—Copper Evaporators, 5' dia., 500 sq. ft.
1—Double Effect Evaporator, 7' dia.
15—NEW S.S. Kettles, 60, 80, 100, 150, 300, 500 gal.
10—NEW S.S. Tanks, 100 to 500 gal.
5—Pfaudler 200, 1000 gal. Jktd. Kettles
20—Copper Jktd. Kettles, 20 to 100 gal.
3—Alum. Jktd. Kettles, 30 to 125

3—Buffalo, Devine Vacuum Shelf Dryers, 10 and 14 shelves
1—Devine Lab. Vacuum Shelf Dryer
2—Stokes 1½' x 3½' 30" x 8' Rotary Vacuum Dryers
1—Copper Shell Rotary Dryer, 6' x 17'
1—Rotary Steam Tube Dryer, 6' x 27'6"
3—Vacuum Drum Dryers, 24" x 20", 48" x 40", 5' x 6'

7—Cast Iron Filter Presses, 30" to 36"
5—Filter Presses, Wood, 18" to 36"
2—Oliver, Swenson Rotary Filters, 4'x5', 8'x10'

6—Tolhurst Centrifugals, 32", 40", 48"
3—Sharples No. 6 Super Centrifuges
4—De Laval Nos. 600, 700 Centrifuges

6—Robinson, Rotex Sifters, 20"x48", 40"x56"
5—Baker Perkins, Readco 100 gal. Double Arm Jacketed Mixers
1—Read Stainless Steel Double Arm Mixer, 4 gal.
9—NEW 1000 and 2000 lb. Powder Mixers

30—Stokes Tablet Machines, ½" to 2½"
5—Bucket Elevators, 13' to 50' high
10—12" Belt Conveyors, 20' to 80'

PARTIAL LIST ONLY.
YOUR INQUIRIES SOLICITED.

BRILL EQUIPMENT COMPANY
225 West 34th Street,
New York 1, N. Y.

FOR SALE

Miller Cellophane Box Wrapper & Sheeter.
Model C Cherry-Burrell Bottle Washer with motor driven pump.
1 HP Lipman Self contained Ammonia Refrigerating Unit with A.C. motor.
80-qt. Read and Triumph Mixers.
Type MG 4" Economy Centrifugal Pump, 8" Gould Impeller Pump.
16" and 20" Buffalo Food Choppers.
Buffalo Feed Grinder with 8½" plates.
600 gal. Copper Kettle with coils for heating.
16" Kent Burr Stone Mill, belt drive.
16" Schutz-O'Neill Style D Limited Pulverizer with dust collector.

SAVAGE BROS. CO.
2638-46 Gladys Avenue Chicago

2—Louisville Rotary Steam Tube Dryers, 6' dia., 50' long.

1—Shriver Iron Filter Press, 36"x36", open delivery, side feed, washing type, 26 plates, 27 frames.
2—Read type P7 Jacketed Mixers, double arm, pulley driven, power dump, 100 Gal. working Cap.
1—American 6' 3-disc Filter.
3—Aluminum Welded Tanks, ¼" #2SH Aluminum, 6'x12'; 3'6"x8'; 5'x8'.
1—Sprout-Waldron 3 High Roller Mill, 9"x24", three pair high.
2—Sprout-Waldron Bragging Machines, Monarch Style V Packer.
1—"Buffalo" Meat Grinder, 7½" dia. screw.
1—High Chrome Iron Tank, 6'x30', ¼" plate.
50—Aluminum Rubber-Lined Closed Tanks, 461-gals. Send for our "GELB NEWS FLASH".

R. GELB & SONS, INC.
Union, N. J. UNionville 2-4900

FOR SALE

2—Model G-I-D Single Unit Stokes & Smith Universal Filling Machines, with one pound auger and filling tube with jars—¾ HP AC 220, 60 Cycle Motor.

2—Container Equipment Company Adjustable semi-automatic carton sealing machines, Model A-3901-12, equipped with 12 feet feeding conveyor, 8" spacing, 12" guards.

Further particulars available by writing to:

THE SWEETS COMPANY of AMERICA INC.
1515 Willow Avenue Hoboken, N. J.
Hoboken 3-2300

FOR SALE

PULVERIZER

1—Pulverizer Schultz - O'Neill Style D, 22"; Capacity 250# 1000# per hour

Address Replies to
FS-122, Food Industries
330 West 42nd St., New York 18, N. Y.

FOR SALE

One Anderson - Barngrover Continuous Rotary Pressure Cooker and Cooler now set on No. 2's. Can be altered to accommodate No. 2½. This machine now in operation. This is a large, fast line all automatic control.

One 9 pocket Ayers Universal bean and tomato Filler, only run 40,000 cans. Tomato equipment never used.

RUSSELL CORPORATION
Plant City, Florida Box 431

FOR SALE

PFAUDLER G.L. Vac. Pans 75 to 150 gals.
KIEFER #3 Bronze Rotary Gear Visco Filler Kettles—Aluminum and Stainless Steel
SHRIVER & SPERRY Filter Presses—Wood Plates & Frames 18"-36"
1—SPERRY 24" C.I. Filter Press, O.D., 44 plates
6—Copper Coating Pans 24" to 38"
9—Tablet Machines, COLTON & STOKES, 1" to 2½" Pellets
3—DAY 200# Powder Mixers
STOKES #15 Auger Powder Filler, M.D.
B & B Hydraulic Press 48"-200 Ton Cap.
DE LAVAL #600 Centrifuge M.D.
BUFFALO FDY Flaker 24" x 20", Bronze Drum
BUFFALOVAK 32" x 90" Atmospheric Double Drum Dryer

Send for Bulletin A-12 Now Ready With Hundreds of Other Items Listed.

WE WILL BUY YOUR SURPLUS

MACHINERY & EQUIPMENT CORPORATION (of N. Y.)
533 W. Broadway New York 12, N. Y.
Gramercy 5-6680

CASE STACKER

Camichael Portable. Maximum height 10' complete with ¾ horsepower, single phase, 60-cycle motor. Used only slightly; in excellent condition. Write

FS-123, Food Industries
330 West 42nd St., New York 18, N. Y.

VIBREX SCREENS

Style J, 24" x 96", both new and once used. All in excellent condition. Write

FS-124, Food Industries
330 West 42nd St., New York 18, N. Y.

FOR SALE
COOLING TANK

76' long, 8' wide, 4' deep, 360 ft. Number 488 pintle chain complete 14 retorts 60 inches high, 6 retorts 72 inches high, 7 retorts 75 inches high, 15 perforated crates 4 tier, 85 trolleys and hooks, 1 hoist with ⅜" cable.

SARDIK FOOD PRODUCTS CORPORATION
Shirley, Indiana

FOR SALE
Laboratory Equipment

For dehydrated foods or food processing plant.

HY-DRY PRODUCTS, INC.
333 N. Michigan Avenue Chicago

These advertisements

are live opportunities in the field of food processing and distribution.

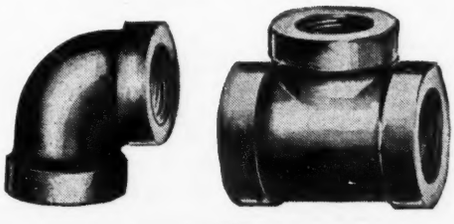
Each announcement represents a current Want or Offering of an organization or individual in the field, with some element of profit in each for whoever can fill the need. Some have money-saving possibilities, others are opportunities for more business; many are employment opportunities; still others offer property, or equipment—used or surplus new equipment.

"Searchlight" advertisements are constantly changing. New opportunities are constantly finding their way into this great Want medium, each issue. Regular reading of the "Searchlight" pages can be as important to you as reading the editorial sections; Editorial matter is news of the industry; Advertising is NEWS OF OPPORTUNITIES offered in the industry.

for EVERY business WANT "Think SEARCHLIGHT first"

FOR INDUSTRY'S PIPELINES

Here is a wide range of sizes and types of valves and pipe fittings for industrial uses. **Don't delay—contact your nearest WAA Regional Office immediately to assure getting the particular items you need. The entire inventory is priced well below distributor's costs.**

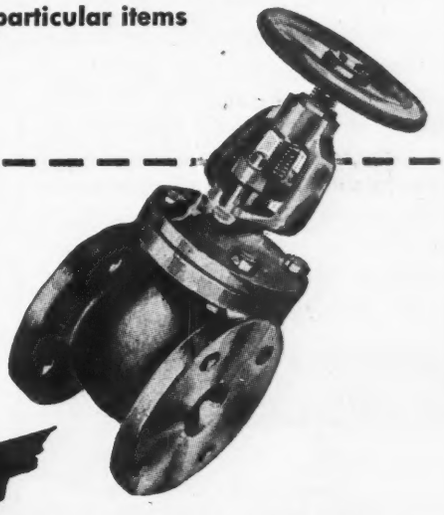


FITTINGS

MATERIALS: Cast Iron, Malleable Iron, Steel, Brass.

SIZES: ¼" to 36"

PRESSURE: 125 lbs. p.s.i. to 3000 lbs. p.s.i.



VALVES

TYPES: Gate, Globe, Angle, Check, Plug, Cross.

MATERIALS: Iron, Brass, Steel.

SIZES: ¼" to 36"

END CONNECTIONS: Screw, Flange, Welded, etc.

PRESSURE: 100 lbs. p.s.i. to 3000 lbs. p.s.i.

WAR ASSETS ADMINISTRATION

GOVERNMENT OWNED SURPLUS

Offices located at: Atlanta • Birmingham • Boston • Charlotte Chicago • Cincinnati • Cleveland Dallas • Denver • Detroit • Fort Douglas, Utah • Fort Worth Helena • Houston • Jacksonville Kansas City, Mo. • Little Rock Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • New York • Omaha Philadelphia • Portland, Ore. Richmond • St. Louis • San Antonio • San Francisco Seattle • Spokane • Tulsa

827-1

All valves and fittings are sold under existing priority regulations. VETERANS OF WORLD WAR II are invited to be certified at the War Assets Administration Certifying Office serving their area, and then to purchase the materials offered herein

This material is available for export. Any question on export control should be referred to Office of International Trade, Department of Commerce, Washington, D. C.

Send Today for

"BETTER WAYS TO *Low Count Milk*..."

... an 8-page important new Booklet telling how to easily and completely control bacterial growth on dairy farms and in milk product processing, storage, and distributing equipment and plants. This invaluable, informative booklet—our Bulletin No. D—is a *must* for safe, efficient, and economical sanitation. Send for your FREE copy today.

MAIL THIS COUPON NOW!

Please rush my free copy of "Better Ways to Low Count Milk."

FIRM NAME_____

MY NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

WE MAKE_____

125

THE EMULSOL CORPORATION
59 East Madison Street, Chicago 2, Ill.

ADVERTISERS IN THIS ISSUE

Aerotec Company 222
Air Express Div. Railway Exp. Agency 252
*Allis-Chalmers Mfg. Co.....5, 14, 22
Alloy Steel Products Co., Inc..... 13
Aluminum Company of America..... 165
Aluminum Cooking Utensil..... 195
Alvey Conveyor Mfg. Co..... 199
American Can Co..... 153
American Coolair Corp..... 220
American Gas Association..... 223
American Mat Co..... 220
American Pipe & Const. Co..... 228
American Rolling Mill Co..... 131
Ames Iron Works..... 151
*Anchor Hocking Glass Corp.....10, 27
*Armstrong Cork 115, 116
Aseptic Thermo Indicator Co..... 187
Associated Bag & Apron Co..... 156

Baker Raulang Co..... 144
Barry Wehmiller Machinery Co..... 178
Bauer Bros. Co..... 232
Bemis Bro. Bag Co..... 203
Berlin Chapman Co..... 236
*Blickman, Inc., S..... 212
Brown Co. 226
Brown Instrument 181
*Buffalo Forge Co..... 129
Buffalo Weaving & Belting Co..... 125
Buffalo Wire Works Co..... 142

Canning Machy. 147
Carpenter Steel Co..... 56
Case Co., A. T..... 58
Century Electric Co..... 41
Chase Bag Co..... 198
*Cherry-Burrell Corp. 68, 164
*Chicago Pneumatic Tool Co..... 240
Christian Science Monitor..... 201
City Ice & Fuel Co..... 244
Cleaver-Brooks Co. 188
Cleveland Plain Dealer..... 133
Consolidated Siphon Supply Co., Inc.. 176
Container Corp. 219
Corn Products 191
*Corning Glass Works.....51, 127
*Crane Co. 251
Crescent Truck Co..... 24
Crown Cork & Seal Co..... 182
Cyclone Fence Co..... 172
*Cyclotherm Corp. 149

Darnell Corp., Ltd..... 190
Dayton Rubber Co..... 53
Derby Cold Storage..... 244
Detecto Scales Inc..... 180
Diamond Crystal Salt Co..... 209
*Diversey Corp. 141
Dodge & Olcott, Inc..... 125
*Dow Chemical Co..... 208
Dow Corning Corp..... 205
Dreyer, Inc., P. R..... 237

Electric Steel Fdry..... 47
*Economic Machinery Co..... 4
Emulsol Corporation 250
Eriez Mfg. Co..... 17

*Fairbanks, Morse & Co..... 186
*Farquhar Co., A. B..... 224
Ferry Co., J. D..... 174
First Machinery Corp..... 171
Federal Electric 241
Filtrol Corp. 35
Fleishel Lumber Co..... 136
Ford Motor Co..... 65
Frick Co. 132
Fritzsche Bros. Inc..... 217

Gardner-Richardson Co..... 30
Gaylord Container Corp.....Third Cover
*General Amer. Transp. Corp..... 23
*General Controls Co..... 176
General Biochemicals Inc..... 231
*General Electric 48
Girdler Corporation 138
*Globe Steel Tubes, Inc..... 184
Globe Woven Belting Co..... 160
Goodyear Tire & Rubber Co..... 9
Greer Co., J. W..... 161
Grinnell Co. 6
*Gump Co., B. F..... 198

Hartford Empire Co.....62-63
Hoffman-La Roche, Inc..... 120
Howard Engineering Co..... 163
Howell Electric Motors Co..... 26
Hummel & Downing Co..... 119
Huron Milling Co..... 231

Ingersoll Steel Div. Borg Warner Co. 49
Inland Container Corp..... 16
Inland Steel Container Co..... 140
International Nickel Co..... 60

*Jackson & Church Co..... 174
*Jeffrey Mfg. Co..... 67
Jenkins Bros. 31
*Johns-Manville 126

*Keasbey & Mattison, Inc..... 28
Kennedy Valve Mfg. Co..... 36
*Koven & Bro., Inc., L. O..... 207

LaBour Co., Inc..... 169
LaPorte Mat. & Mfg. Co..... 194
Leberco Labs 117
*Lee Metal Products Co., Inc..... 132
*Leeds & Northrup Co..... 44
Linde Air Products Co..... 54
*Link Belt Co..... 7
Liquidometer Corp. 194
Lubriplate Div. Fiske Bros. Refg. Co. 222
Lunkenheimer Co. 214

Mack Trucks, Inc..... 221
*Magnus, Mabee & Reynard Co..... 128
Manheim Mfg. Co..... 38
*Marco Co., Inc..... 34
Master Electric Co..... 25
Mathews Conveyor Co..... 148
*Mathieson Alkali Works..... 210
Mercer-Robinson Co..... 196
*Merck & Co., Inc..... 227
*Mercoid Corp. 170
Meyercord, Inc. 215
Milprint, Inc. 50
Missouri, State Dept. of Resources and Development 187
Monarch Mfg. Works, Inc..... 230
*Monsanto Chemical Co.....157, 206
*Morse Chain Co..... 180

*Nash Engineering Co..... 113
*National Airoil Burner Co..... 142
National Can Corp..... 204
National Starch 59
New Haven R. R..... 134
*Niagara Blower Co..... 168
*Niagara Filter Corp..... 239
Nicholson Co., W. H..... 136
Nukem Products Corp..... 241
*Nutritional Research Asso..... 231

*Okite Products, Inc..... 162
*Orr & Sembower, Inc..... 145
Owens-Corning Fiberglas Corp..... 135

*Package Machinery Co..... 130
Paisley Products, Inc..... 8
*Palmer Co. 202
Patterson Fdy. & Machy. Co. Second Cover
Penick & Co., S. B..... 209
Pennsylvania Salt Mfg. Co..... 150
*Pfaudler Co. 11
*Pfizer & Co., Inc., Chas..... 225
Pittsburgh Corning Corp..... 143
Pneumatic Scale Corp., Ltd..... 213
Powell Co., Wm..... 137
Powers Regulator Co..... 231
*Pulverizing Machinery Co..... 239

Quaker City Cold Storage..... 244

Reading Pratt & Cady Div..... 66
Refined Syrups & Sugars, Inc.....18-19
Refining, Unincorporated 158
Republic Steel Corp.....32-33
Reynolds Electric Co..... 124
Reynolds Metals Co.....42-43
Riegel Paper Corp..... 118
Rhinelander Paper Co..... 211
Ross Heater & Mfg. Co., Inc..... 200
*Rossotti Lithograph Co..... 52
Royal Co., Thomas M.....20-21
Ryerson & Son, R. T..... 119

*Sarco Company 117
Schwartz Laboratories, Inc..... 233
St. Louis Globe Democrat..... 45

(Continued on page 252)

Everything for your Piping Job from One Complete line

The type of installation—or size of the job—makes no difference. Whatever your piping needs—selecting from the *complete* Crane line assures the maximum benefits of standardization.

For this ammonia compressor installation, for instance, one order to your Crane Branch or Wholesaler covers all the piping materials. Specifying, buying, and erecting—every step of the job is simplified because you deal with a single, responsible source. And watch how it speeds piping maintenance work.

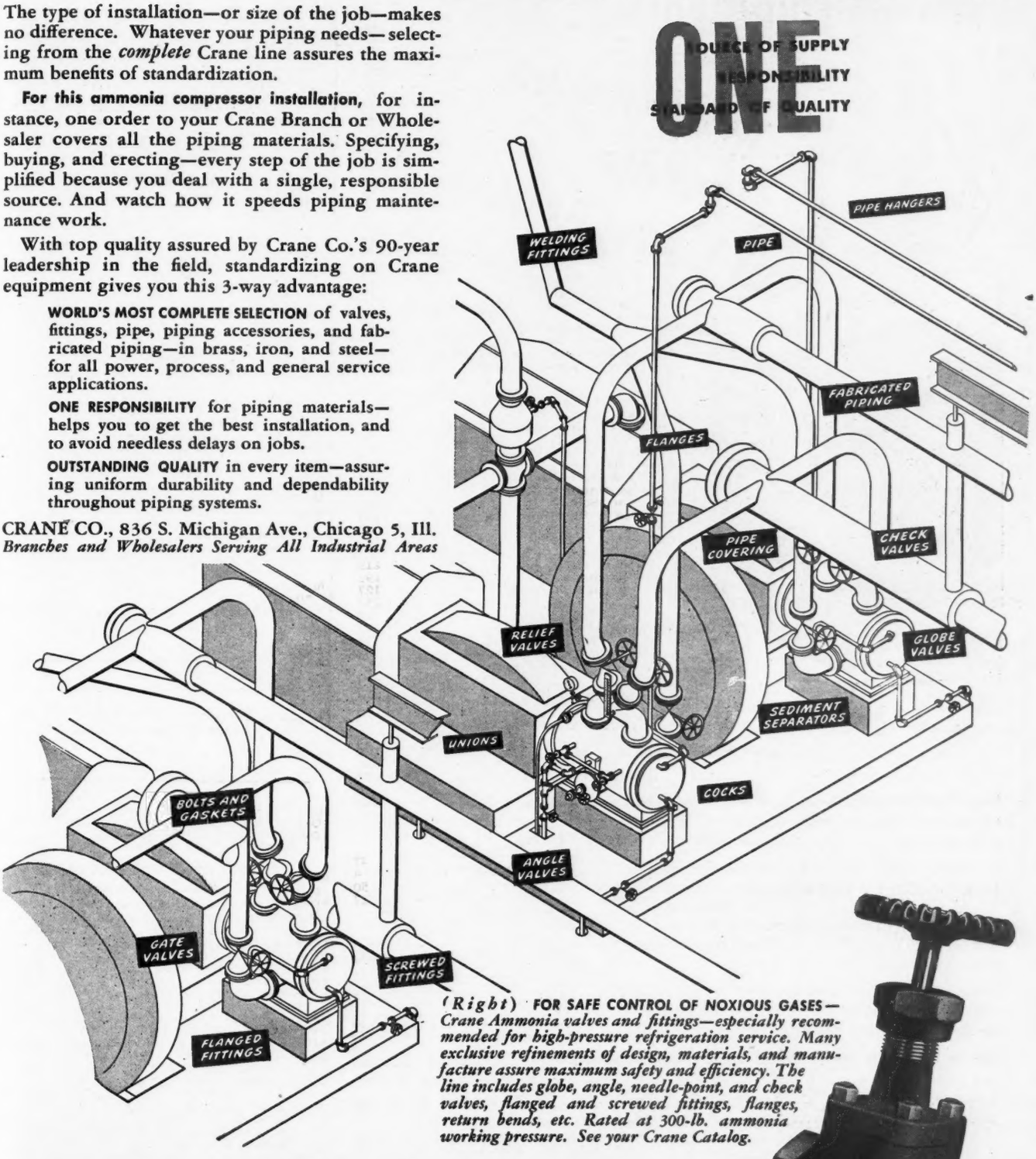
With top quality assured by Crane Co.'s 90-year leadership in the field, standardizing on Crane equipment gives you this 3-way advantage:

WORLD'S MOST COMPLETE SELECTION of valves, fittings, pipe, piping accessories, and fabricated piping—in brass, iron, and steel—for all power, process, and general service applications.

ONE RESPONSIBILITY for piping materials—helps you to get the best installation, and to avoid needless delays on jobs.

OUTSTANDING QUALITY in every item—assuring uniform durability and dependability throughout piping systems.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas



(Right) **FOR SAFE CONTROL OF NOXIOUS GASES**—*Crane Ammonia valves and fittings—especially recommended for high-pressure refrigeration service. Many exclusive refinements of design, materials, and manufacture assure maximum safety and efficiency. The line includes globe, angle, needle-point, and check valves, flanged and screwed fittings, flanges, return bends, etc. Rated at 300-lb. ammonia working pressure. See your Crane Catalog.*

EVERYTHING FROM . . .

VALVES • FITTINGS
PIPE • PLUMBING
HEATING • PUMPS

CRANE

FOR EVERY PIPING SYSTEM

Now, on all your Air Express shipments

Big, Fast Planes now in Airline service — and more planes of every type — mean quicker delivery for your Air Express shipments — with plenty of space for all you want to send. More "same-day" deliveries to serve you better.

Cost Way Down, too! Economies in large planes, large volume, are passed to you in drastically reduced rates. Included, of course, is special pick-up and delivery in all major U. S. towns and cities. Fast air-rail schedules to and from 23,000 off-airline communities.

Direct Foreign Service between the United States and scores of countries. The world's best service, in the world's best planes!

RATES CUT 22% SINCE 1943 (U. S. A.)

AIR MILES	2 lbs.	5 lbs.	25 lbs.	40 lbs.	Over 40 lbs. Cents per lb.
149	$1.00	$1.00	$1.00	$1.23	3.07¢
349	1.02	1.18	2.30	3.68	9.21¢
549	1.07	1.42	3.84	6.14	15.35¢
1049	1.17	1.98	7.68	12.28	30.70¢
2349	1.45	3.53	17.65	28.24	70.61¢
Over 2350	1.47	3.68	18.42	29.47	73.68¢

INTERNATIONAL RATES ALSO REDUCED

Write Today for the Time and Rate Schedule on Air Express. It contains illuminating facts to help you solve many a shipping problem. Air Express Division, Railway Express Agency, 230 Park Avenue, New York 17, N. Y. Or ask for it at any Airline or Railway Express office.

AIR EXPRESS

AIR EXPRESS

GETS THERE FIRST

Phone AIR EXPRESS DIVISION, RAILWAY EXPRESS AGENCY
Representing the AIRLINES of the United States

ADVERTISERS IN THIS ISSUE

St. Regis Paper Co. 154, 155
Salem Engineering Co. 39
Seedburo Equipment Co. 160
Shellmar Products Co. 197
Shepard Niles Crane & Hoist Corp. 185
Solar Aircraft Co. 46
*Sparkler Mfg. Co. 230
*Speedway Conveyors 164
Staley Mfg. Co. 55
Standard Brands, Inc. 192-193
Standard Conveyor Corp. 216
*Stange Co., W. J. 64
Stein-Hall 231
Sterling Electric Motors 61
Stokes Machine Co., F. J. 229
Stokes & Smith Co. 237
*Sturtevant Mill Co. 253
Sutton, Steele & Steele, Inc. 233
*Swenson Evaporator Co., Div. of Whiting Corp. 37
Sylvania Industrial Corp. 173
Syntron Company 124

Taylor Instrument Co. 40
Texas Co. ..... Back Cover
Timken Roller Bearing Co. 29
Towmotor Corp. 57
Trailmobile Co. 254
*Tri Clover Machine Co. 15
Twitchell, Inc., E. W. 196

Union Carbide & Carbon Corp. 54
Union Special Machine Co. 139
*U. S. Steel Corp. 172

Victor Chemical Works 12
Vico Products Co. 164
Viking Pump Co. 172
*Vitamins, Inc. 231

Walworth Co. 179
War Assets Administration 234-235
West Disinfecting Co. 146
*Wickwire Spencer Div. of Colo. Fuel & Iron Corp. 177
*Winthrop Chemical Co. 152
*Worthington Pump & Machinery 175
Wyandotte Chemical Corp. 218

Yarnall-Waring Co. 122, 123

*For further detailed information regarding this company's products see the 1946 FOOD INDUSTRIES CATALOGS

Ingredients for the Food Processor 231
Professional Services 238
Storage, Frozen Foods 244

SEARCHLIGHT SECTION

Classified Advertising

BUSINESS OPPORTUNITIES 243
DISMANTLING 244
EMPLOYMENT 242, 243
SPECIAL SERVICES 243
WANTED TO PURCHASE 244
USED EQUIPMENT 244-249
Alexander Trading Co. 244, 247
Barliant & Co. 244
Brill Equipment Co. 248
Buckeye Cooperage Co. 244
Chelsea Milling Co. 244
Consolidated Products Co., Inc. 247
Duncan Coffee Co. 244
Emsco Equipment Co. 246
First Machinery Co. 245
Friel, S. E. W. 244
G & H Equipment Co. 244
Gelb & Sons, Inc., R. 248
Girard Machinery & Equipment Co. 247
Juliep Co. 244
Kehoe Machinery Corp., Lester 247
Lockhead Mfg. Co. 246
Loeb Equipment Supply Co. 247
Machinery & Equipment Co. 246
Machinery & Equip Corp. (of N.Y.) 248
Max Ams Inc. 244
Packaging Sales Co. 248
Perry Equipment & Supply Co. 246
Russell Corp. 248
Sardik Food Prod. Corp. 244, 248
Savage Brothers Co. 248
Sprague, E. K. 247
Sweets Co. of America Inc. 248
Union Standard Equipment Co. 246
War Assets Administration 249
Yeast Processing Equip. Co. 244

Sturtevant Blenders handle all intake and discharge through one opening. Simple, single lever opens and closes gate. Illustration at left shows machine receiving . . . right discharging.

4-WAY MIXING ACTION

Assures Uniform, Perfectly Blended Batches with Sturtevant Rotary Batch Blenders

Because Sturtevant Rotary Blenders use a 4-way mixing action, they provide a *thoroughly blended product* no matter what the ingredients . . . densities . . . weights . . . finenesses . . . or other physical properties of the materials to be blended.

Here's how they operate—as materials are poured into the receiving hopper, they are picked up by the revolving buckets, and carried to the top of the blending chamber where they are cascaded and intimately mixed. At the same time the drum revolves forcing the materials from both ends toward the center of the drum . . . while the swinging chute, which is in the blending position produces an important lateral fourth mixing action. The result, a perfect blend with *no* substances floating to remain unmixed.

Investigate Sturtevant Rotary Batch Blenders. They are available in many sizes with capacities from 1000 to 7500 lbs. Write for details and specifications.

STURTEVANT MILL COMPANY

84 Harrison Square, Boston 22, Mass.

Designers and Manufacturers of

CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS
MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS

This NEW Platform is Built for Your Tough Jobs

With 15" Main Frame Rails of High Tensile Steel that is 43% Stronger

Try your toughest jobs on this newly designed platform by Trailmobile.

Certainly, the use of high tensile steel that is 43% stronger, gives it extra strength without extra weight. But it took advanced engineering to design and build it into an integral unit platform that gives greater strength and positive protection against load concentration. Now, loads at the ends of the outriggers have equal support as those in the center. And, as always, Trailmobile gives you the easiest pulling undercarriage in the industry.

Naturally you want the whys and wherefores —the down to earth reasons for the tough performance of this new platform. In simple words, 15" main frame rails with flush outriggers and cross-members on 18" centers are built into one integral unit. Result—extra strength without increased weight. So, there's no more need for trussing to support the sides.

In every respect this platform is built especially for tough jobs. It has sturdier guard rails, lengthwise flooring, stake-pockets every 18"—"internally" lubricated props, low level loading.

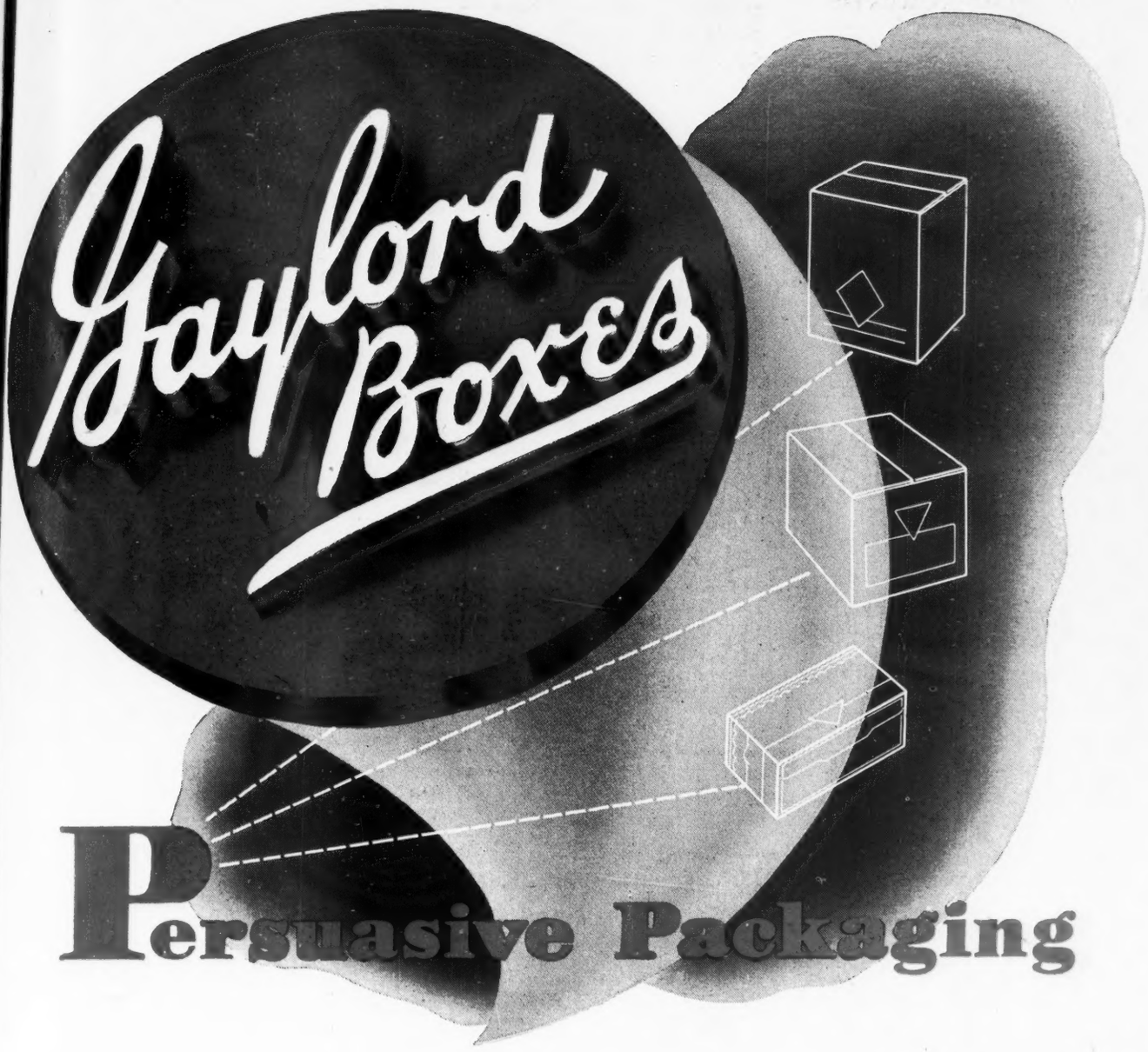
Any way you look at it — every way you examine it — this great, new platform is another example of the reason why THE TREND IS TO TRAILMOBILE — a fact you can verify by contacting your near-by Trailmobile Branch.

★ ★ ★

THE TRAILMOBILE COMPANY
Cincinnati 9, Ohio

The Trend is to

71 Customer Service Centers



Persuasive Packaging

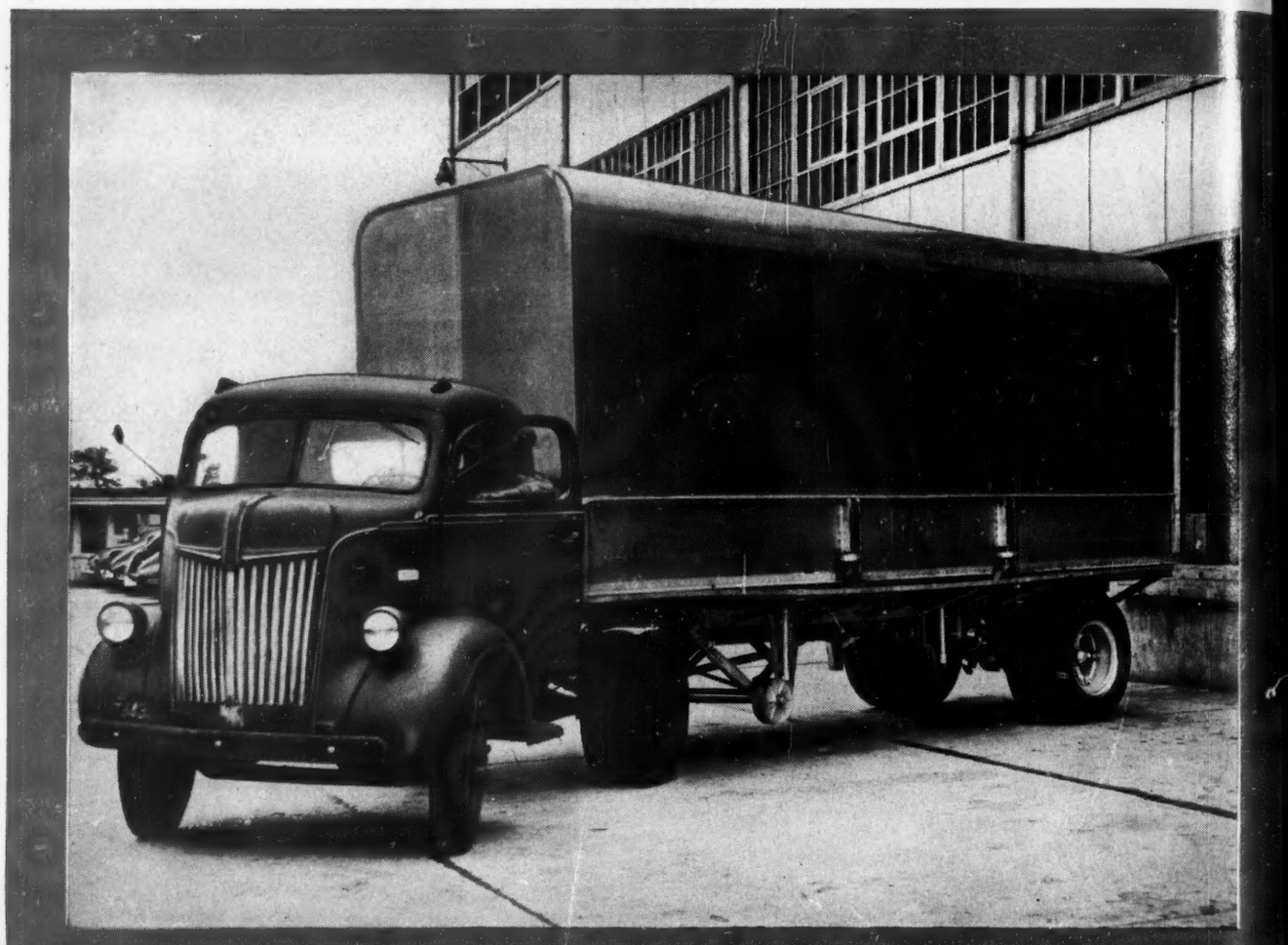
★ Correct functional design—better materials —distinctive printing—and correct color harmony—these are four basic factors that assure safe delivery and greater sales appeal. You get them all in Gaylord Boxes.

Corrugated and Solid Fibre Boxes ●
Folding Cartons ●
Kraft Grocery Bags and Sacks ●
Kraft Paper and Specialties ●

GAYLORD CONTAINER CORPORATION, General Offices: SAINT LOUIS

Standard of The Packaging Industry

New York • Chicago • San Francisco • Atlanta • New Orleans
Jersey City • Seattle • Indianapolis • Houston • Los Angeles
Oakland • Minneapolis • Detroit • Jacksonville • Columbus • Fort
Worth • Tampa • Cincinnati • Dallas • Des Moines • Oklahoma
City • Greenville • Portland • St. Louis • San Antonio • Memphis
Kansas City • Bogalusa • Milwaukee • Chattanooga • Weslaco
New Haven • Appleton • Hickory • Greensboro • Sumter



A Sure Way to Reduce Hauling Costs

USE *Texaco Marfak* to protect chassis parts against wear. *Marfak* is cohesive and adhesive — stays where you put it. It resists road splash, heavy loads and jarring road shocks — assures fewer repairs and replacements. That's why *Marfak*-lubricated trucks stay in service longer, cost less to maintain, greatly reduce hauling costs.

To prolong the life of wheel bearings, use *Texaco Marfak Heavy Duty*. It stays in the bearings despite high speeds, heavy loads and extremes of temperature — sealing itself in, sealing out dirt and moisture, assuring safer braking. No seasonal change is required.

These benefits explain why more than 250 million pounds of Marfak have been used to date!

For Texaco Products and Lubrication Engineering Service, call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Lubricants and Fuel

FOR ALL TRUCKING EQUIPMENT

Tune in . . . TEXACO STAR THEATRE presents the NEW EDDIE BRACKEN SHOW every Sunday night. See newspapers for time and station.

station.